Arya Samaj Foundation Chennai

VOL. II ADT - 1985 UNIVERSITY OF

R
016
UNI-A.2

R
016
UNI-A.2

Public Domain. Gurukul Kangri Collection

Digitized by Arya Samaj Foundation Chennai and eGangotri

ABSTRACTS OF DOCTORAL THESES

Vol. II

ADT - 1985

Lib

R.
016
UNI-A.2

UNIVERSITY OF JODHPUR

JODHPUR (INDIA)

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

R
016
UNI-A.2

6901

गुरुकुल कांगड़ी विश्वविद्यालय, हरिद्वार
कृपया पुस्तक के ऊपर कोई निशान आदि
न लगायें।

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

D6901

पुस्तकालय

गुरुकुल काँगड़ी विश्वविद्यालय, हरिद्वार

वर्ग संख्या R 016 आगत संख्या 6901

UNI-A.2

पुस्तक-वितरण की तिथि नीचे अंकित है। इस तिथि सहित २० वें दिन तक यह पुस्तक पुस्तकालय में वापिस आ जानी चाहिए। अन्यथा १० पैसे के हिसाब से विलम्ब-दण्ड लगेगा।

Stock Verification-2024

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

R016, UNI-A.2
6901

ABSTRACTS
OF
DOCTORAL THESES, 1985

DONATION
6901

पुस्तकालय
पुस्तकालय
गुरुकुल कांगड़ी विश्वविद्यालय

Stock Verification-2024

UNIVERSITY OF JODHPUR
JODHPUR (INDIA)

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

R
016
UNI-A.2

Published by
University of Jodhpur, Jodhpur 342001 (India)

Printed at
Jodhpur University Press, Jodhpur

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

Foreword

Research is one of the most important and essential activities of the University. Some of the best students are attracted towards it and they register themselves as research scholars for Ph.D. under competent research supervisors. They devote themselves assiduously to the pursuit of knowledge either from the point of the discovery of new facts or the interpretation of facts or both. They present their findings in the form of a thesis and earn doctoral degree after successfully defending their thesis during the viva-voce examination.

As per Ordinance 215-A of the University of Jodhpur, the research scholar is required to submit, alongwith his thesis, a short abstract in which shall be included the objectives and the extent to which these have been achieved alongwith the main findings of the thesis.

For better co-ordination of research effort in different Universities, the University Grants Commission in its letter No. F. 15-10/83(CP) dated 10 November, 1983 has suggested that the abstracts of doctoral theses should be circulated to all universities (concerned departments), the UGC and other funding agencies.

The above suggestion of the UGC was warmly welcomed by the Research Boards and the Academic Council of the University of Jodhpur. Accordingly, it was decided by the Publication Board of the University that the University shall bring out a publication entitled 'Abstracts of Doctoral Theses' based upon the theses which are approved for the award of doctoral degrees during each calendar year. It also decided that 10 reprints of abstracts be given free of charge to each research scholar and his supervisor for their use.

The present volume, which is the second in the series, contains the abstracts of 44 theses which have been approved for the award of the doctoral degree by the University of Jodhpur during the calendar year 1985.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

It gives me pleasure to place on record my sincere appreciation of the sustained effort made by the research scholars, research supervisors, Heads of Departments, Academic Section of the University and the University Press in bringing out this volume. I am sure they would keep it up and ensure its publication in time in future for the benefit of all concerned.

M. L. MATHUR
Vice-Chancellor

March 31, 1986

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

Contents

FACULTY OF ARTS, EDUCATION AND SOCIAL SCIENCES

HINDI

आचार्य हजारीप्रसाद द्विवेदी : सृष्टि और दृष्टि —हरीदास व्यास 1

राजस्थानी और हिन्दी भाषा एवं साहित्य के सन्दर्भ में कन्हैयालाल सेठिया के कृतित्व का मूल्यांकन —कुसुम सिंघवी 9

हिन्दी के समाजवादी यथार्थवादी कथा-साहित्य में रोमानी तत्त्व —(कुमारी) वर्षा मेहता 17

छायावाद कालीन प्रमुख हिन्दी उपन्यासों में युग-चेतना —(कुमारी) इन्द्रा रानी माथुर 27

भक्त कवि ईसरदास : व्यक्तित्व और कृतित्व —(कुमारी) वीणा पुरोहित 35

हिन्दी एकांकी नाट्य साहित्य के परिप्रेक्ष्य में डा० रामकुमार वर्मा के एकांकी साहित्य का अध्ययन —शोभा जोशी 47

राजस्थानी साहित्य में कृष्णभक्ति काव्य —श्रीमती तारा भाटी 57

SANSKRIT

नाटकलक्षणरत्नकोश का विवेचनात्मक अध्ययन —(कुमारी) यशोरानी गौड़ 1

RAJASTHANI

राजस्थानी साहित्य में महिलाओं का योगदान —श्रीमती चैनकंवर शेखावत 1

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

ENGLISH

Black Consciousness and the Autobiographical Form with special reference to Richard Wright Malcolm X and Eldridge Cleaver —Mrs. Sudhi Rajiv 1

Feminine Point of View in the Novels of Elizabeth Bowen —Mrs. Swatantar Kapoor 5

POLITICAL SCIENCE

The Indian Democracy : Its Fundamental Challenges and Plausible Solutions —Madhu Bhatnagar 1

The Nature of Indian Federalism : Emerging Trends —(Miss) Ranu Jhota 19

ECONOMICS

Financing Economic Development in India through Deficit Financing —Manorma Hukku 1

Economics of Major Agrobased Industries in India : A Case Study of Cotton Textile Industry of India —Pratibha Bhargava 19

HISTORY

Royal Princes and the Law of Succession in Ancient India —Mahesh Chandra Joshi 1

PHILOSOPHY

सर्वोदय का दार्शनिक आधार —कु० चन्द्रकांता व्यास 1

GEOGRAPHY

Significance of Geomorphology in Spatial Planning of an Arid Environment—A Case Study of Jodhpur District —Surendra Singh 1

Population Geography of Rajasthan Canal Command Area —Satish Chandra Mishra 11

A Geographical Study of Flood Hazard in Desert and Semi-Desert Environment : A Case Study of Luni Basin with Satellite Remote Sensing Technique —Kamal Narain Joshi 19

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

PSYCHOLOGY

A Cross-Sectional Study of Mental Health Problems in relation to Family Syntality and Reactions to Frustration
—RAVI KANT GUNTHEY 1

FACULTY OF SCIENCE

BOTANY

Biosystematics of Ber (*Zizuphus Mauritiana* Lamk.) Cultivars
—BRIJ BHUSHAN VASHISHTHA 1

Studies on the Jurassic Flora of the Rajmahal Hills, India —*Gymnospermous Fructifications and Sporae Dispersae*
—O. P. SUTHAR 5

Intercropping Fodder and Grain Legumes with a Rainfed Perennial Grass *Cenchrus Ciliaris* Linn.
—MAHANDER SINGH 9

Palynotaxonomy of Zygophyllaceae —ARUNA MATHUR 13

CHEMISTRY

Studies on Chemical Spectroscopy
—VIKRAM KUMAR NARULA 1

Spectroscopic Studies of Dyes and Some Luminiscent Compounds in Presence of Surface Active Agents
—MILAP CHAND GOUD 7

Kinetics and Mechanism of the Oxidation of Organic Compounds —A. L. JAIN 13

Studies on Proton Dissociation Reactions in Aqueous and Non-Aqueous Media —GHANSHYAM LAL RAI 19

Voltammetric Studies in Pollution Control (Cyclic Voltammetric Behaviour of Some Toxic Metal Ions)
—PRADEEP KUMAR SHARMA 27

Mechanistic Studies of N-Halogeno Reagents
—VINITA SHARMA 37

Studies on Isothiouronium Salts —G. L. SHARMA 43

Analytical Studies on Pollutants and Toxic Substances in Industrial Waste Waters —SHYAM LAL KALANI 51

Fluorescence and Absorption Studies of Some Organic Molecules —SEEMA ACHARYA 57

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

Studies on Reagents for Peptide Synthesis —(Miss) Indu Doshi 65

Analysis of Trace Bio-Organics by Electroanalytical Techniques —(Mrs.) Sunita Kumbhat 67

Chemical Studies of Medicinal Plants of Rajasthan Desert with special reference to *Citrullus Colocynthis* —(Miss) Upma Gupta 73

Physico-Chemical Studies of Certain Metal Chelates with New Ligands and their Analytical Applications —Jagadamba, J. Y. 77

ZOOLOGY

Structure and Functions of Ventral Scent Marking Gland of the Indian Gerbil, *Tatera Indica Indica* Hardwicke and the Role of Odours in Behavioural Communication —Mohd. Idris 1

MATHEMATICS

A Study of Hydromagnetic Boundary Layer Flow Problems —Ram Niwas Jat 1

FACULTY OF COMMERCE

Regional Rural Banks in India (An Appraisal with special reference to Rajasthan) —Bajrang Lal Vaishnaw 1

Analysis of Financial Statements of Aluminium Industry in India —U. R. Daga 15

Marketing of Wool in Arid and Semi-Arid Areas : A Study of Western Rajasthan —Ashok Singhvi 35

Long Term Co-operative Lending in Rajasthan : An Analytical Study —Shri Vallabh Sharma 41

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

Faculty of Arts, Education and Social Sciences

Hindi	1—68
Sanskrit	1—6
Rajasthani	1—6
English	1—6
Political Science	1—32
Economics	1—26
History	1—8
Philosophy	1—12
Geography	1—30
Psychology	1—14

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

आचार्य हजारीप्रसाद द्विवेदी : सृष्टि और दृष्टि

हरीदास व्यास

वर्ष १९८५ में पी-एच०डी० (हिन्दी) की उपाधि के लिए
जोधपुर विश्वविद्यालय द्वारा स्वीकृत शोध-प्रबन्ध का सारांश*

उपन्यासकार, निबन्धकार, आलोचक और इतिहासकार आचार्य हजारीप्रसाद द्विवेदी ने इन चारों विधाओं के लेखन में अभूतपूर्व मौलिकता का परिचय दिया है। हिन्दी के कथाकारों की भीड़ में संख्या की दृष्टि से बहुत कम, केवल चार, उपन्यास लिख कर भी गुणात्मकता की दृष्टि से द्विवेदीजी चोटी के उपन्यास-कारों की पंक्ति में आए।

हिन्दी साहित्य में ललित निबन्धों के नाम से केवल द्विवेदीजी के ही निबन्ध हैं, जो प्रतिमान हैं। विचारों और भावों की समानान्तर किन्तु सहगामी धारा उनके निबन्धों की मूल विशेषता है। आचार्य द्विवेदी के निबन्ध-लेखन का यह स्वरूप आचार्य शुक्ल के निबन्ध-लेखन का न सिर्फ विकास अपितु नये तेवर के साथ निबन्धों के स्वरूप की पुनर्सृष्टि है।

हिन्दी साहित्य के इतिहास-लेखन में आचार्य द्विवेदी के समक्ष विधेयवाद के अतिरिक्त मार्क्सवादी इतिहास लेखन-पद्धति भी थी। उन्होंने प्रभाव तो दोनों ही से लिया परन्तु अपने हिन्दी साहित्येतिहास ग्रन्थों में उन्होंने परम्परा के अविच्छिन्न प्रवाह में मनुष्य और उसकी संस्कृति को रख कर हिन्दी साहित्य का जो इतिहास प्रस्तुत किया, वह न विधेयवादी है न मार्क्सवादी; अपितु वह साहित्य-इतिहास का सत्यान्वेषण है।

आचार्य द्विवेदी की सर्जनात्मक-आलोचना ने आलोचना को रचना और पाठक के बीच का वास्तविक सेतु बनाकर आलोचना के व्यावहारिक स्वरूप की स्थापना की है।

आचार्य हजारीप्रसाद द्विवेदी की विविध विधाओं में की गई गरिमामय सृष्टि और उस सृष्टि के पीछे मूल में कार्य कर रही दृष्टि का समग्र अध्ययन प्रस्तुत शोध में दो खण्डों में किया गया है। प्रथम खण्ड में उनकी सृष्टि की आधारभूत दृष्टि का अध्ययन है। दोनों ही खण्ड दो-दो अध्यायों में विभक्त हैं।

---

*यह शोध डॉ० विमलचन्द्र सिंह, सह आचार्य, हिन्दी विभाग, जोधपुर विश्व-विद्यालय, जोधपुर के निर्देशन में किया गया।

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

खण्ड एक : सृजन

प्रथम अध्याय : संक्षिप्त जीवन परिचय

२० अगस्त १९०७ को जन्मे हजारीप्रसाद द्विवेदी का बाल्यकाल व किशोरावस्था आर्थिक परेशानियों में गुजरी। इसी के परिणाम स्वरूप वे सेन्ट्रल हिन्दू कॉलेज की नियमित फीस जमा नहीं करा पाए, स्वाभिमान ने प्रिन्सीपल श्री ध्रुवजी के आगे गिड़गिड़ाने नहीं दिया; अत: उस समय परीक्षा देना भी सम्भव नहीं हुआ। कालान्तर में कथाएँ बांच कर आर्थिक कारणों से अटके कार्यों को सम्पन्न किया। ७ नवम्बर १९३० को वे शान्तिनिकेतन पहुँचे। शान्तिनिकेतन पहुँचना वे अपना दूसरा जन्म—द्विजत्व प्राप्ति का दिन मानते हैं। यहाँ आचार्य द्विवेदी की बहुत सी पुरानी मान्यताएँ टूटीं, परम्पराओं, संस्कारों और सोच का परिमार्जन हुआ। स्पष्ट रूप से यह मान्यता स्थापित व पुष्ट हुई कि मनुष्य ही साहित्य का लक्ष्य है। उसी की जय-विजय, उसी की महायात्रा साहित्य का उपजीव्य है। कवि रवीन्द्र और क्षितिमोहन सेन जैसे महापुरुषों का सान्निध्य और उनका चिन्तन आचार्य द्विवेदी की दृष्टि के आधारभूत कारण हैं।

सन् १९४९ में 'डॉक्टर ऑफ लिटरेचर' की उपाधि लखनऊ विश्वविद्यालय से मिली और जुलाई १९५० में बहुत अन्तर्द्वन्द्व के बाद काशी विश्वविद्यालय पहुँचे। परन्तु काशी विश्वविद्यालय ने आचार्य द्विवेदी को मानसिक अशान्ति ही दी। यद्यपि इस काल में भी उनका सृजन अवरुद्ध नहीं हुआ। यहां तक कि १९६० में जब उन्हें काशी किश्वविद्यालय से निष्कासित कर दिया तो उस परिस्थिति को भी निर्वात दीप की तरह बिल्कुल निष्कम्प रहते सह गये। अन्तर्मन के ज्वार-भाटों की अभिव्यक्ति हुई 'कुटज' के रूप में। १९५७ में काशी विश्वविद्यालय से निकाले जाने पर अपमान का घूंट पीकर राष्ट्रपति से पद्मभूषण उपाधि से सम्मानित होने वाले आचार्य द्विवेदी १९६० में चण्डीगढ़ पहुँचे। १९६७ में पुन: काशी विश्वविद्यालय पहुंचे। उनके लिए तय किया गया आचार्य पद फिर नहीं मिला। रेक्टर बने, उसके बाद 'हिन्दी का ऐतिहासिक-व्याकरण' योजना के निदेशक बने। यहाँ से उत्तर प्रदेश की हिन्दी ग्रन्थ अकादमी पहुँचे। लेखन कार्य का नैरन्तर्य बना रहा। इस बार काशी ने वापस नहीं बुलाया। १९ मई १९७९ को आचार्य द्विवेदी की इस महायात्रा का अन्त हुआ।

अपनी इस महायात्रा में आचार्य द्विवेदी ने चार कालजयी उपन्यास लिखे—१९४६ में बाणभट्ट की आत्मकथा, १९६३ में चारु चन्द्रलेख, १९७३ में पुनर्नवा और १९७६ में अनामदास का पोथा।

द्विवेदीजी ने ललित व आलोचनात्मक, दोनों ही प्रकार के निबन्ध लिखे। ललित निबन्ध संग्रहों में १९५१ में 'कल्पलता' प्रकाशित हुआ। १९६४ में

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

'कुटज', १९७१ में 'अशोक के फूल', और १९७२ में 'आलोक पर्व' प्रकाशित हुए।

आलोचनात्मक निबन्ध-संग्रहों में १९४० में 'प्राचीन भारत का कला विकास', १९४५ में 'विचार और वितर्क', १९४८ में 'साहित्य का मर्म', १९५३ में डॉ० श्री कृष्ण लाल के साथ 'निबन्ध-संग्रह' और १९५७ में 'विचार-प्रवाह' के बाद 'साहित्य-सहचर' का प्रकाशन हुआ। इनके अतिरिक्त विभिन्न ललित निबन्ध संग्रहों में भी उनके आलोचनात्मक निबन्ध देखे जा सकते हैं।

इन संग्रहों के अतिरिक्त भी विभिन्न पत्र-पत्रिकाओं में उनके निबन्ध स्वतन्त्र रूप से प्रकाशित होते रहे।

१९४० में आचार्य द्विवेदी ने पहला साहित्येतिहास-ग्रन्थ 'हिन्दी साहित्य की भूमिका' लिखी। १९५० में नाथों के सांस्कृतिक और ऐतिहासिक महत्त्व का विवेचन करने वाला ग्रन्थ 'नाथ-सम्प्रदाय' प्रकाशित हुआ। १९५० में 'मध्यकालीन धर्म साधना' ग्रन्थ प्रकाशित हुआ। १९५१ में भारतीय वाङ्मय और १९५२ में विद्यार्थियों के लिए विशेष रूप से लिखा 'हिन्दी साहित्य : उद्भव और विकास' प्रकाशित हुआ। १९५२ में ही 'हिन्दी साहित्य का आदिकाल' साहित्येतिहास ग्रन्थ प्रकाशित हुआ। १९६५ में 'आधुनिक साहित्य बोध' का प्रकाशन हुआ।

आलोचना विधा में आचार्य द्विवेदी ने सैद्धान्तिक व व्यावहारिक, दोनों ही प्रकार की आलोचनाएँ लिखीं। सैद्धान्तिक आलोचना में मनन करते हुए उन्होंने आलोचना का एक जीवन्त स्वरूप निर्धारित किया और उसके आधार पर उन्होने सूर साहित्य १९३६, कबीर १९४२, मृत्युञ्जय रवीन्द्र १९६३ और कालीदास की लालित्य योजना १९६५ जैसे व्यावहारिक आलोचना ग्रन्थ लिखे।

उपरोक्त ग्रन्थों के अतिरिक्त भी आचार्य ने धर्म, कला और संस्कृति सम्बन्धी ग्रन्थ भी लिखे, कई ग्रन्थों का सम्पादन व अनुवाद भी किया। ज्योतिष सम्बन्धी लेख भी उनके विभिन्न निबन्ध संग्रहों में प्रकाशित होते रहे। आचार्य द्विवेदी की मनुष्य के प्रति गहन आस्था और सुलझी दृष्टि के परिणाम-स्वरूप उनकी रचनाओं में उर्ध्वमुखी दर्शन और उदात्त मानसिकता है। टूटते मूल्यों के प्रति बन्दरियों की भाँति विवेकहीन मोह नहीं, नवागत के प्रति जिज्ञासा है; पाण्डित्य का भार नहीं, विशाल ज्ञान का विनीत स्वरूप है; स्थापित सत्यों के प्रति रूढ़ आस्था नहीं अपितु उन्हें सामयिकता के सन्दर्भ में परखने की सामर्थ्य है।

द्वितीय अध्याय : सृजन प्रक्रिया

सृजन मनुष्य की अन्यतम उपलब्धि है। इस उपलब्धि पर विचार करते हुए इसकी प्रक्रिया पर विचार करना स्वाभाविक है। विश्व के सभी साहित्य चिन्तकों ने इस पर कमोवेश रूप में चिन्तन किया। उपलब्ध विचारों से तो

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

तरह-तरह के निष्कर्ष मिलते हैं। प्रथम, सृजन प्रक्रिया अनायास और अवचेतन मन की प्रक्रिया है। द्वितीय, सृजन प्रक्रिया सायास और सचेतन मन की प्रक्रिया है। स्पष्टत: दोनों ही निष्कर्षों में अतिवादिता है।

रचना-प्रक्रिया के पहले स्तर 'भावन' में रचनाकार बाह्य जगत से संवेदना ग्रहण करता है। इस 'भावन' में यद्यपि रचनाकार का संस्कार, परिस्थितियां आदि बहुत से तथ्य रहते हैं फिर भी यह स्तर रचनाकार के मन को अनायास व विभिन्न रूपों में प्रभावित करता है। दूसरे स्तर में रचनाकार ग्रहण की गई संवेदना को मानसी आकार देता है, रचना का मानसिक स्तर पर संयोजन करता है और तीसरे स्तर में अभिव्यंजना करते हुए उस संयोजन को विधागत आकार देता है। इस प्रकार 'भावन' से लेकर 'अभिव्यंजना' तक की यात्रा रचना प्रक्रिया है, जिसमें 'भावन' का आरम्भ अवश्य मन को परोक्ष रूप से संवेदित करते हुए अनायास और अचेतन स्वरूप को छूता है पर शेष प्रक्रिया संवेदना का सचेत कलात्मक उपयोग है। अपने शिल्पगत अनुशासन के कारण रचना विधा के अनुसार स्वरूप ग्रहण करती है।

चूंकि आचार्य द्विवेदी ने विभिन्न विधाओं में लेखन किया, अत: उन्हें विभिन्न प्रकार के शिल्पगत अनुशासन से प्रत्यक्ष होना पड़ा। विधा चाहे कोई भी रही हो, सर्वत्र उनकी सृष्टि में दृष्टि सहगामी प्रमाणित हुई है।

आचार्य द्विवेदी के चारों उपन्यासों की मूल संवेदना में मानवीय आस्था है। इसी मूल संवेदना को उन्होंने विभिन्न उपन्यासों में विभिन्न कालों, परिस्थितियों और फलकों में अभिव्यक्त किया है। आचार्य के उपन्यासों की संप्रेषणीयता के मूल कारक हैं—सुगठित और वैज्ञानिक संरचना और कुशल शिल्प। वे काल व पात्रानुसार भाषा-प्रयोग करते हैं परिणामत: उनके उपन्यासों में एक प्रवाह विशेष है।

आचार्य द्विवेदी के निबन्ध भाव और विचार की कुशल अभिव्यंजना हैं। आचार्य शुक्ल की तरह उनके निबन्धों में विचार पक्ष थकने पर हृदय पक्ष उपस्थित नहीं होता अपितु दोनों आरम्भ से ही समानान्तर रूप में चलते हैं। उनके निबन्धों के मूल तत्त्व हैं—कल्पना की स्वच्छन्द उड़ान और तद्जन्य भाव-विह्वलता। वस्तुत: आचार्य के शैलीगत वैशिष्ट्य उनके विचारों के भावोद्वेग के सहज प्रतिफल हैं।

आलोचना के क्षेत्र में आचार्य हजारीप्रसाद द्विवेदी ने आलोचना की सैद्धान्तिकता और विश्लेषण में लेखक की मूल संवेदना को विवेकपूर्ण ढंग से साथ रखा। परिणाम स्वरूप वे लेखक को मूल-भावना को सहज-रूप से सामने लाने में सक्षम हुए। आलोचना का यह रूप रचना और पाठक के बीच का वास्तविक सेतु है। हिन्दी आलोचना के लिए आलोचना का यह स्वरूप सर्वथा मौलिक व नवीन था।

साहित्येतिहास-लेखन में आचार्य द्विवेदी को गार्सांदतासी से लेकर

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

आचार्य रामचन्द्र शुक्ल के साहित्येतिहास-ग्रन्थ परम्परा के रूप में मिले। निश्चित रूप से आचार्य द्विवेदी ने इस परम्परा से प्रभाव ग्रहण किया परन्तु अपनी नवीन मान्यताओं को भी उन्होंने सप्रमाण स्थापित किया है। इस प्रकार आचार्य द्विवेदी के साहित्येतिहास ग्रन्थ वस्तुतः साहित्येतिहास का वैज्ञानिक विकास है।

आचार्य द्विवेदी का समस्त लेखन सृजन-प्रक्रिया के नये आयामों का उद्घाटन करता है। परिणाम स्वरूप उनके उपन्यास आज भी हिन्दी साहित्य में अछूते हैं, उनके निबन्धों की गरिमा स्तुत्य है, उनके आलोचना और इतिहास ग्रन्थों की सर्जनात्मकता द्रष्टव्य है।

खण्ड दो : दृष्टिकोण

तृतीय अध्याय—दृष्टिकोण निर्माण की पीठिका

दृष्टिकोण वह वैज्ञानिक दृष्टि है जो युगीन स्थितियों और भविष्य की सम्भावनाओं से पुष्ट होती है, जिसके साथ एक ठोस विचारधारा और सुस्पष्ट चिन्तन रहता है। साहित्य की सार्थकता के लिए यह दृष्टिकोण अनिवार्य है।

आचार्य द्विवेदी को भारतीय और पाश्चात्य दोनों ही प्रकार की चिन्ताधारा की परम्परा मिली। भरतमुनि से लेकर आचार्य रामचन्द्र शुक्ल तक का भारतीय काव्यशास्त्रीय चिन्तन का उन्हें आधार मिला था। उधर प्लेटो की काव्यशास्त्रीय चिन्तन धारा से लेकर डार्विन के विकासवाद, फ्रायड का स्वप्नवाद और मार्क्स का द्वन्द्वात्मक भौतिकवाद के सिद्धान्तों की लम्बी परम्परा से भी वे अपरिचित नहीं थे। साथ ही साथ समसामयिक युगीन परिस्थितियों ने भी उनके सोच को दिशा दी। इस प्रकार लेखक की युग-चेतना सिद्धान्तों और सामयिक परिस्थितियों का आधार लेकर विकसित हुई। उनके सारे लेखन का यही आधार है।

चतुर्थ अध्याय : विचार सृष्टि

आचार्य द्विवेदी के साहित्येतिहास ग्रन्थों में इतिहास की प्रमुख अवधारणाएं हैं—प्राचीनता, मध्ययुगीनता, आधुनिकता और पुनर्जागरण। आचार्य द्विवेदी की दृष्टि में प्राचीनता की सार्थकता वहीं तक है, जहाँ तक वह जीवन्त है। जबकि मनोवृत्ति और अर्थ से कटते शब्दों की प्रवृत्ति को आचार्य द्विवेदी ने मध्ययुगीनता कहा। पर उस काल की उपलब्धियों को विशेष रूप से रेखांकित करने का श्रेय भी आचार्य द्विवेदी को ही है। मध्ययुगीनता के परिप्रेक्ष्य में ही उन्होंने आधुनिकता पर विचार किया। कबीर-सूर जैसे कवियों को वास्तविक प्रतिष्ठा दिलवाना, भक्तिकाल को हारी हुई मनोवृत्ति के आरोप से मुक्त करवाना, जैन साहित्य को हिन्दी साहित्य की निधि के रूप में

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

प्रतिष्ठित करवाना आदि आचार्य द्विवेदी की दृष्टि की आधुनिकता के ही प्रतिफलन हैं।

आचार्य जिस काल में 'हिन्दी साहित्य की भूमिका' लेकर आए, वह काल देश में व्यापक परिवर्तनों, वैचारिक बदलावों का काल था। सही अर्थों में पुनर्जागरण काल था। आचार्य द्विवेदी ने पुनर्जागरण पर यद्यपि कोई स्वतन्त्र पुस्तक तो नहीं लिखी परन्तु उस काल के सुख-दुःख का परिचय उनकी रचनाओं में देखा जा सकता है।

आचार्य द्विवेदी ने आलोचना हेतु पहले आलोचना के पूर्व सिद्धान्तों का विश्लेषण किया। उस विश्लेषण के निष्कर्षों के आधार पर आचार्य ने नये सिद्धान्तों का निरूपण किया। आचार्य द्विवेदी के अनुसार आलोचना का आधार है मानवीय बुद्धि और संतुलित दृष्टि। इस बुद्धि और ऐसी दृष्टि के साथ आलोचक की यह स्पष्ट मान्यता है कि साहित्य का लक्ष्य मनुष्य ही है। ऐसा मनुष्य जिसका सुख-दुःख, हित-हानि आदि आम आदमी के साथ जुड़े हुए हैं। इस स्पष्टता के साथ आलोचक को रचना के सौन्दर्य-वैशिष्ट्य को रचना में ही खोजना चाहिये न कि आलोचना के रूढ़ प्रतिमानों के आधार पर।

आलोचना के इस व्यावहारिक स्वरूप की खोज का श्रेय आचार्य द्विवेदी को ही है, जिन्होंने आलोचना को रचना और पाठक के बीच का वास्तविक सेतु बनाया।

आचार्य के निबन्धों में तार्किकतापूर्ण ढंग से विचार का विश्लेषण देखा जा सकता है। इस विचार का उपजीव्य है—मानवीय आस्था। इसी विचार को पुष्ट करते हुए उनके निबन्ध भावों को अपने साथ एकमेव करके इसे और भी सम्प्रेषणीय बना देते हैं। इस सम्पूर्ण प्रक्रिया में उन निबन्धों में विचारों के विशेष क्रम और संगठन का संतुलन बना रहता है, परिणामतः विचारों का प्रवाह अक्षुण्ण रहता है। यही कारण है कि आचार्य द्विवेदी के निबन्धों में वैचारिकता और लालित्य एक दूसरे के समानान्तर रहते हुए एक दूसरे के सहगामी रहे हैं। यही निबन्धों की सम्प्रेषणीयता का मूल कारक है।

आचार्य द्विवेदी के उपन्यासों में इतिहास और कल्पना पूरक तत्त्वों के रूप में विद्यमान है। कल्पना भी उनके उपन्यासों में यथार्थ के आग्रह से उपस्थित हुई है। ये उपन्यास कलात्मक-इतिहास से भी एक चरण आगे ऐतिहासिक रोमान्स की सृष्टि करते हुए दीखते हैं, जिनका जीवन-दर्शन मध्यकाल की मानवता में संचरित होते हुए भी वर्तमान का पाथेय बनता है। प्राचीन कलेवर में भी वर्तमान दृष्टि विद्यमान है। इन उपन्यासों की संवेदना सामयिक है। सामयिकता का सम्बन्ध वे इतिहास से ही बनाना चाहते हैं। यही उनका परकाया-प्रवेश है।

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

इस प्रकार आचार्य द्विवेदी के उपन्यास गप्प कथ्य से आरम्भ होकर दृष्टि-पथ पर निरन्तर विकास पाते हैं। कल्पना के व्यापक प्रभाव के कारण आचार्य उपन्यासों को गप्प कहते हैं। पर यही गप्प आधुनिक संवेदना को साथ लेती हुई भविष्योन्मुखी दृष्टि-पथ पर अग्रसर होती है।

उपसंहार

आचार्य द्विवेदी ने सर्जन और दृष्टिकोण दोनों ही क्षेत्रों में प्रतिमान स्थापित किये। उनके उपन्यास आज भी हिन्दी उपन्यास-यात्रा के वे मील के पत्थर हैं, जहाँ अन्य किसी हिन्दी उपन्यास के पहुँचने की प्रतीक्षा है। पर यह भी सच है कि उन उपन्यासों की विशिष्टताएँ ही कहीं-कहीं उनकी सीमाएँ बनी हैं।

निबन्ध के क्षेत्र में आचार्य की उपलब्धि विवाद से परे है। परन्तु परवर्ती निबन्धकारों में दृष्टि, ज्ञान और सृजनात्मकता का संतुलन न होने के कारण आचार्य द्विवेदी के निबंधों की परम्परा का विकास नहीं हो पाया। आचार्य द्विवेदी की आलोचना यद्यपि आलोचना के व्यावहारिक स्वरूप की खोज थी। उसकी वैज्ञानिकता को भी चुनौती नहीं दी जा सकती। परन्तु परवर्ती आलोचक—मानवीय बुद्धि और संतुलित दृष्टि की निरपेक्षता को निबाह नहीं पाए।

आचार्य द्विवेदी के साहित्येतिहास-ग्रन्थ साहित्येतिहास लेखन की एक वैज्ञानिक-परम्परा की सम्भावना को उद्घाटित करते हैं।

आचार्य द्विवेदी पर यह आरोप लगाया जा सकता है कि उन्होंने किसी परम्परा के विकास की सम्भावनाएँ नहीं रखी। क्योंकि उन्होंने विभिन्न विचार के सत्यों को स्वीकारा है। परन्तु आचार्य पर यह आरोप ही आचार्य का वैशिष्टय है कि उनकी दृष्टि हमेशा सत्यान्वेषी रही। इस सत्यान्वेषण के लिए उन्हें किसी विचार के प्रति पूर्वाग्रह अथवा दुराग्रह नहीं। उनका यही सत्यान्वेषण हिन्दी साहित्य की महत्त्वपूर्ण उपलब्धि है।

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

राजस्थानी और हिन्दी भाषा एवं साहित्य के संदर्भ में कन्हैयालाल सेठिया के कृतित्व का मूल्यांकन

कुसुम सिंघवी

वर्ष १९८५ में पी-एच.डी. (हिन्दी) की उपाधि के लिए
जोधपुर विश्वविद्यालय द्वारा स्वीकृत शोध-प्रबन्ध का सारांश*

शूरमाओं, सन्तों और साधकों की लीलास्थली राजस्थान का प्रतिमा-सम्पन्न प्रतिनिधि कवि श्री कन्हैयालाल सेठिया का सम्पूर्ण जीवन ही साहित्य साधना के लिए समर्पित है। श्री सेठिया राजस्थानी और हिन्दी दोनों के काव्य-मुकुटों का तेजस्वी हीरक है। अमृत की तलाश ही जिनके चिन्तन का मूल है, वे कन्हैयालाल सेठिया कवियों में सौम्य सन्त हैं जिनके बहुमुखी व्यक्तित्व ने जो नई गति एवं दिशा दी है, वह राजस्थान के आधुनिक युग में रेखांकित करने योग्य है। अनिवर्च के वागीश कविवर सेठिया की 'शब्द यात्रा' राष्ट्रीय चेतना और अध्यात्म-दर्शन की दूरी के दो छोरों के बीच की दौड़ है। सेठियाजी में विलक्षण प्रतिमा है जो अन्तश्चैतन्य के उर्ध्वगामी ज्योतिर्वलयों में उड्डीयमान है, मनीषियों की साधना से मंडित है। उनका व्यक्तित्व राजस्थान एवं राजस्थानी भाषा की सृजनधर्मिता का प्रतीक और पर्याय बन गया है, वे राजस्थानी संस्कृति के पुरोधा हैं।

श्री सेठिया का सम्पूर्ण काव्य, जीवन की चरम विरोधी धाराओं के बीच विराजित सत्य के अस्तित्व को ढूंढने के गूढ़तम अनुभूतियों की जय-यात्रा है। उनका कृतित्व उनके व्यक्तित्व को प्रतिबिम्बित करता है और उनका व्यक्तित्व उनके कृतित्व को रूपायित। उनकी धारणा है 'महामौन तक पहुंचाने का माध्यम मेरी गीत शिखाएँ।' सेठियाजी राजस्थानी गौरव एवं शालीनता के आस्थावान व्याख्याता तथा अपनी चिरन्तन संस्कृति के अमर आख्याता हैं।

राजस्थानी, हिन्दी और उर्दू में कविवर सेठिया की समान गति है। आज तक सेठियाजी ने साहित्य को ग्यारह हिन्दी की—१. वनफूल, २. अग्निवीणा, ३. मेरा युग, ४. दीपकिरण, ५. प्रतिबिम्ब, ६. आज हिमालय बोला, ७. खुली खिड़कियाँ चौड़े रास्ते, ८. प्रणाम, ९. मर्म, १०. अनाम, एवं ११. निर्ग्रन्था; राजस्थानी की सात—१. रमणिये रा सोरठा, २. मींझर, ३. गळगचिया,

*यह शोध डॉ. नित्यानन्द शर्मा, प्रोफेसर एवं पूर्व अध्यक्ष, हिन्दी विभाग, जोधपुर विश्वविद्यालय, जोधपुर के निर्देशन में किया गया।

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

४. कूंकूं, ५. लीलटांस, ६. धर कूंचा धर मजळां, एवं ७. मायड़ रो हेलो (तथा एक उर्दू ताजमहल—देवनागरी लिपि में) की कुल उन्नीस कृतियां भेंट की हैं।

अपनी पीर किसी के उर में पहुंचा दूं,
बस इतना माता। (दीपकिरण)

सेठिया जी का व्यक्तित्व सक्रिय जीवन की विभिन्न अनुभूतियों से सिक्त होकर उभरा और उनके हिन्दी एवं राजस्थानी तथा उर्दू काव्यों ने उन्हीं से अपना रस ग्रहण कर गंगा-यमुना-सरस्वती की निर्मल धाराएँ प्रवाहित की हैं।

कृतियों का विश्लेषण

'वनफूल के गीतों में यौवन की अनस्पर्शित ताजगी और किशोर सुलभ भावुकता मिलती है तथा इनमें प्रकृति की छटा सर्वत्र बिखरी हुई है। 'अग्निवीणा' में राष्ट्रीय भावना का ताण्डव नृत्य है जिनमें कवि ने 'दग्ध कण्ठ से दग्ध राग में 'अग्निवीणा' पर गाया है। 'दीपकिरण' का कवि चिरन्तन का साधक है। उसने अपने अनुभूत भाव-मुक्ताओं को गीत-सीपियों में भरा है। प्रकृति का ऐश्वर्य विभिन्न रूपों में इन्द्रधनुषी रंगों में उभरा है। इस लासानी गीत-संग्रह में कवि विसंगतियों के बीच में एक संगति की खोज में है। 'मेरा युग' में चरमता और निम्नता की स्वाभाविक आकृतियों ने युग के गवाक्ष से झाँका है। 'प्रतिबिम्ब' में व्यक्ति की आत्मानुभूति जैसे समष्टि की-सी हो जाती है। अधिकांश कविताएँ बिम्ब-प्रतिबिम्बवाद के अद्वैत वेदान्त से सम्बंधित हैं। 'आज हिमालय बोला' में सेठिया का प्रबुद्ध कवि-मन निरन्तर दायित्व-बोध के प्रति सजग है। उसने चीन, पाकिस्तान आक्रमणों के संदर्भ में जनता का उद्‌बोधन किया है।

काव्यत्व और नयापन दोनों में समृद्ध 'खुली खिड़कियाँ चौड़े रास्ते' में कुछ झांकती अभिव्यक्तियां और भटकती अनुभूतियाँ हैं। जीवन के भोगे हुए क्षणों के बीच जीवन-सत्य की उपलब्धियों का मार्मिक अंकन हुआ है। आत्म-बोध के साथ युग-बोध भी है और इसी के साथ कवि नयी कविता के क्षेत्र में प्रवेश करता है। चिन्तन और दर्शन के धरातल पर पूरी तौर से प्रतिस्थापित सेठिया ने हिन्दी काव्य को एक नया ध्रुव दिया 'मर्म'। नपी तुली भाषा में ऐसी तन्मयता में, गीतों में सहज समर्पण का स्वर है। अनुभूति की गहनता ने ही शब्दों को विरल कर दिया है। असंभव संक्षिप्तता में अर्थ अगाध है। 'अनाम' के छोटे-छोटे सूत्रों में जीवन का गहन रहस्य है। चिन्तन का नया आयाम है, नया प्रयोग है। विराट के बोध का उपक्रम है, भाव और चिन्तन की अद्‌भुत संयुति है। 'प्रणाम' की चिन्तन-प्रधान कविताओं में धर्म विरोधी दो धाराओं के बीच में विराजित सत्य के अस्तित्व को ढूंढने

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

की कवि की दृष्टि रही है। 'निर्ग्रन्थ' अनुकम्पा के परम क्षण की प्रतीक कृति है। रागात्मक द्वंद्व से मुक्त होकर एक निर्वद मनः स्थिति की ओर कवि अग्रसर है। आत्म-संवेदन से अधिक आत्म-बोध की कविताएँ हैं 'निर्ग्रन्थ' में।

उर्दू काव्य-क्षमता को प्रकट करने वाली कृति 'ताजमहल' नाजुक और नफीस है। नई बिम्बात्मकता का 'ताजमहल' एक अद्भुत खजाना है। ताजमहल की शब्दों में अनूठी प्रतिलिपि प्रस्तुत की है सेठियाजी ने।

'मींझर' में स्थानीय वातावरण का जीवन्त चित्रण है, भावों के निखार में अनूठी विशेषता है। 'पाताल पीथल', कुण जमीन रो धणी ?, "धरती धोरां री' ने सेठिया को लोकप्रियता प्रदान की। इनमें देशभक्ति एवं मर्यादा के सजीव और मर्मस्पर्शी चित्र हैं। 'कूं कूं,' सेठिया के अनुभवों का निचोड़ है। 'हर पृष्ठ कुँकुँम की बिन्दी से सज्जित है जो सेठिया की काव्य प्रतिभा के प्रौढ़ सौभाग्य का परिचायक है।' —श्री गणपतिचन्द्र भंडारी। 'गळगचिया' का प्रत्येक गळगचिया कई अभिव्यक्तियों के प्रतीक हैं। शब्दों के परिधान में से निकल कर सत्य उद्घाटित होता है जो कितना अपना, कितना शाश्वत और कितना सूक्ष्म पर कितना विराट है। प्रकृति और परमात्मा के साथ अपनत्व का ही 'लीलटांस' के कवि का मूल स्वर है। 'लीलटांस' में सृजन की पुकार है, उसमें युग-बोध देने की अपूर्व क्षमता है। 'मींझर' के कवि की भौतिक जगत् से मानसिक जगत की यात्रा है जबकि 'लीलटांस' की कविताएँ मानसिक जगत् से आध्यात्मिक जगत् की यात्रा कही जा सकती है। 'रमणिया रा सोरठा' नीति काव्य है जिसमें सोरठों के माध्यम से 'सीख' दी गई है। 'घर कूँचा घर मजळां' रससिद्ध कवि सेठिया के अनुभव से परिपक्व अमृत-फल का श्रेष्ठ निचोड़ है। 'मायड़ रो हेलो' में मातृभाषा राजस्थानी को 'बी रो ओपतो रुतबो दिराणे वास्ते' एक जुझारू प्रयत्न है।

संस्कृति और संवेदना

सेठियाजी अपनी काव्य-कृतियों द्वारा राजस्थान में अपने युग के सांस्कृतिक जागरण के वैतालिक सिद्ध हुए। 'युग-संघर्ष' से लोहा लेकर कवि ने अपने को सशक्त सर्जक सिद्ध किया। जन-संवेदना, युग सत्य की अभिव्यक्ति उनकी काव्य-कृतियों के प्राण हैं। जीवनगत सत्य के निदर्शनार्थ उन्होंने ऐसी कृतियों का प्रणयन किया जिनमें संघर्षरत, नवोदित राष्ट्रीय संघर्षों, आकांक्षाओं को अभिव्यक्ति मिली। गीतों में उत्कृष्ट कोटि की संवेदनशीलता विद्यमान है। काव्य में अन्तर्भेदन, अन्तर्दृष्टि, आन्तरिक अनुभूतियों एवं मानवीय भावनाओं का संयोजन है।

राजस्थानी कृतियों का अनुभूति (कथ्य) एवं अभिव्यक्ति (शिल्प) पक्ष

सेठियाजी की राजस्थानी कृतियों की भाषा सहज और सरल होते हुए भी

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

सशक्त और प्रवाहपूर्ण है। उन्होंने अपनी अभिव्यक्ति को प्रभावशाली बनाने के लिए लाक्षणिक प्रयोगों का व्यापक सहारा लिया है। उनके अप्रस्तुत विधान पर राजस्थानी जीवन व संस्कृति का गहरा रंग है। वे भाषा की दृष्टि से राजस्थानी के अत्यन्त समर्थ कवि हैं।

मरुधर देश के अमर गायक सेठिया ने अपनी कृतियों में मरुधर प्रदेश की प्रकृति, जीवन, संस्कृति, राष्ट्रीय गति विधियों को भाकार कर अपनी सृजनधर्मिता का पूर्णतः निर्वाह किया है। सेठिया का कवि राजस्थान के जन-जीवन का अभिन्न अंग है, राजस्थानी समाज अपनी समग्रता से उनके काव्यों में मूर्तिमंत हो उठा है। सेठिया जी की उद्बोधक राष्ट्रीय कविताएँ कालजयी हैं। राष्ट्रीय जागृति, देश प्रेम, भाषा (राजस्थानी)-प्रेम की भावनाएं प्रसारित करने में आपका बड़ा हाथ है। प्रकृति-चित्रण सम्बन्धी काव्य में 'सुन्दरम्' के साथ-साथ 'शिवम्' का प्राधान्य रहा है। इनके प्रकृति सम्बन्धी गीत-कल्पना के अनूठेपन, विचारों की मौलिकता और प्रस्तुतीकरण की सर्वथा निजी शैली के कारण विशेष उल्लेखनीय बन पड़े हैं। प्रकृति के माध्यम से शाश्वत सत्यों के उद्घाटन और विभिन्न मानवीय समस्याओं के समाधान में श्री सेठिया विशेष रूप से प्रवृत्त हुए हैं। सेठिया का कवि जन-जीवन से सम्पृक्त है। उनके काव्यों ने युग को वाणी दी है। वे युग-चारण हैं।

सेठियाजी अत्यन्त कुशल शिल्पी हैं। उनका काव्य शिल्प वैविध्य, अछूती (कुवांरी) कल्पनाओं और कलात्मकता का संगम है। छंद-बद्ध कविता और प्रवाह पूर्ण गीतों से आरंभ कर वे अतुकान्त, गद्य-गीतों और सूक्ति के ढंग की क्षणिकाओं और 'मिनि' कविताओं तक पहुँचे हैं। राजस्थानी में ऐसे प्रयोग के वे जनक हैं।

सेठियाजी आधुनिक राजस्थानी कवियों में अपनी अलग 'इमेज' के लिए विशिष्ट स्थान के हकदार हैं। उनके कथ्य में अनुभव की गहराइयाँ, जन-पीड़ा की सघनता, मातृभूमि की वंदना और जीवन-जगत के सूक्ष्म बिम्बों का अद्भुत अंकन एक साथ प्रतिभासित होते हैं।

हिन्दी काव्य-कृतियों का अनुभूति (कथ्य) एवं अभिव्यक्ति (शिल्प) पक्ष :

सेठिया की खड़ी बोली हिन्दी तत्सम प्रधान है, वह संस्कृत निष्ठ परिष्कृत, परिमार्जित, सरल एवं सुष्ठु है। अपने शब्द भंडार को व्यापक व विस्तृत बनाने के लिए उन्होंने अन्य भाषाओं के शब्दों को भी बड़ी उदारता से ग्रहण किया है। ऐसे शब्द उनकी भावाभिव्यक्ति को सशक्त बनाते हैं। भावानुकूल प्रसंगाकूनुल भाषा स्वतः ही निर्झरणी की तरह उद्वेलित हो उठती है। भाषा उनकी कलात्मक निपुणता एवं सौष्ठव का जीवन्त प्रमाण है। भाषा का निखार, व्यावहारिक शब्दावली, सुसम्बद्ध वाक्य विन्यास, प्रभावकारी अभिव्यंजन पद्धति सेठियाजी के हिन्दी काव्य-कौशल सम्बन्धी चरमोत्कर्ष के परिचायक हैं।

सेठियाजी का व्यक्तित्व सक्रिय जीवन की विभिन्न अनुभूतियों से सिक्त

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

होकर उभरा है और उनकी हिन्दी काव्य-कृतियों ने उन्हीं से अपना रस प्राप्त किया है। दृश्य जगत् उनका साधन है और तत्त्व-ग्रहण उनका साध्य। उनकी पैनी दृष्टि वस्तु जगत के अन्तर में झांक कर किसी न किसी चिरन्तन सत्य का उद्‌घाटन करने की अद्‌भुत क्षमता से सम्पन्न है। वे एक ऐसे चिन्तन-शील, सत्यान्वेषी, कुशल शिल्पी कहे जा सकते हैं जिनके मानस की बेचैन तड़प ही कभी गीतों की स्वर लहरी में उमड़ कर और कभी विचार स्फुल्लिगों में चमक कर पाठक के अन्तर को ज्योतित कर जाती है। कवि अन्तर्जगत में प्रवेश कर वस्तुवादी जगत् की जो व्याख्या करते हैं, उससे सत्य शतमुखी होकर उजागर होता है। हिन्दी काव्यों में प्रकृति, मानव स्वभाव, भारतीय दर्शन, राष्ट्रीयता, प्रणय तथा श्रृंगार की विभिन्न स्थितियों और विविध भाव भूमियों का स्पर्श करते हुए कवि ने 'प्राण-यज्ञ की गीत-शिखाओं' को प्रस्तुत किया है। सत्यान्वेषण की प्रतिक्रिया में सेठिया के शब्दों का आधार सूक्ष्म से सूक्ष्मतर होकर सूत्रात्मक होने लगता है, अर्थ की गरिमा बढ़ने लग जाती है और वे 'मर्म' में प्रविष्ट हो जाते हैं।

"करे विषय में सम का स्थापन वह दर्शन ही आर्य है" के रूप में सेठियाजी ने दर्शन को परिभाषित किया है। भारतीय दर्शन की निगूढ़तम अभिव्यक्तियों को सरस एवं हृदयग्राही शब्दों में तथा शैली में अभिव्यक्त करने में वे निष्णात हैं। कवि ने अपने आध्यात्मिक गीतों में जड़-चेतन, प्रवृत्ति-निवृत्ति, बंधन-मुक्ति आदि को एक दूसरे का पूरक प्रमाणित किया है।

सेठियाजी की काव्य-कृतियों में शब्द के पुल पर से अशब्द तक की महायात्रा साकार हुई है। संवेदना जीवन का परम सत्य है। संवेदना ही आत्मा को परमात्मा तक पहुँचाती है और यही संवेदना महावीर की मैत्री बुद्ध की करुणा लाओत्से की एकात्मकता, कन्फ्यूशियस की संलीनता, मुहम्मद का मार्दव, परपस्त्र का परम मंगल है। सेठिया का दार्शनिक कवि भी इसी मंगल की कामना-'सबका मंगल मेरा मंगल' से अपनी अन्तर्यात्रा को पार कर प्रज्ञा के रजत शिखरों तक पहुँचाना चाहता है।

दार्शनिक चिन्तन की प्रधानता होने पर भी सेठियाजी जन-जीवन से कटकर नहीं चले हैं, काव्य में भौतिकता और आध्यात्मिकता का सुखद समन्वय हुआ है। देश में व्याप्त भ्रष्टाचार, अवसरवादिता, साम्प्रदायिकता आदि के कारण मूल्यहीनता का वातावरण व्याप्त है, इसके उन्मूलन तथा मानवीय मूल्यों की संवाहिका के रूप में सेठिया की कविता निःसृत हुई है। उनके प्रणय सम्बन्धी गीतों में श्रृंगार के स्थूल चित्रण की अपेक्षा उसके भावात्मक एवं सूक्ष्म प्रभाव को ही कवि सेठिया ने स्वीकारा है।

स्वतः स्फूर्तता, संक्षिप्तता, लाघव, ध्वन्यात्मकता, संगीतात्मकता एवं एकान्विति गीतों की बाह्य एवं आन्तरिक गुणवत्ता है जो सेठिया के गीतों में अपने सम्पूर्ण वैभव के साथ विद्यमान है। प्रकृति-सुषमा अंकित करने वाले गीत बड़े

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

ही सुमधुर, सरस एवं ललित हैं। सेठिया के गीतों में स्निग्धता है, संगीतात्मकता है और है मर्म स्पर्शिता। कवि के प्रणय-गीत, भक्ति-गीत और प्रार्थनाएँ इस बात के ज्वलन्त प्रमाण हैं कि उनके हृदय का संगीत ही ऐसी गीतिकाओं में झंकृत हुआ है। उनकी गीत-सृष्टि संगीतमयी है।

सेठिया के कवि का हिन्दी काव्य-शिल्प वैविध्य, अछूती कल्पनाओं और कलात्मकता का त्रिवेणी संगम है। उनकी छंद रचना भावानुकूल है। छंद और भाषा प्रयोगों के अनेक बिम्ब कृतियों में बिखरे पड़े हैं। शब्द-शक्तियों का उत्कर्ष दर्शनीय है। प्रारंभिक रचनाओंका अभिधात्मक अभिव्यक्ति सूक्ष्म (लक्ष्यार्थ) होती गई और अंत में (मर्म, अनाम)में सूक्ष्मतर (व्यंग्यार्थ) हो गई। सेठियाजी की अप्रस्तुत योजना का क्षेत्र अत्यन्त विशाल है। अपने विचारों को व्यक्त करने के लिए सेठिया का कवि बिम्बों की सर्जना करता है: उसके मन में स्वरचित बिम्बों का मेला सदा रहता है। सेठियाजी की बिम्बों के प्रति आत्मीयता सघन है इसीलिए अभिव्यक्ति के स्तर पर वे प्रीतिकर और मोहक बन पड़े हैं। कविता इतनी जीवन्त कि शब्द स्वयं रूंधे रूंधे प्रतीत होते हैं। सेठियाजी की भाषा भावानुरूपिणी है। भाषा के माध्यम से रूप-चित्र, भाव-चित्र एवं कलात्मक चित्र अंकित करने में कवि निपुण है। भाषा का गठन एवं प्रवाह सतत विकासोन्मुखी है। शब्द-मैत्री, उक्ति-सौन्दर्य, अप्रस्तुत-विधान सराहनीय है। कुशल कवि अपनी अन्तर्भूत सूक्ष्म भावनाओं को सुष्ठु भाषा में प्रस्तुत करने में निष्णात है। कृतियों में सम्प्रेषण शक्ति पूर्णरूपेण आद्यन्त विद्यमान है। काव्यकृतियों में शुक्ति और शक्ति दोनों का समावेश हुआ है। सेठिया के कवि ने हिन्दी भाषा के गौरव और शक्ति की नित्य-प्रति अभिवृद्धि की है।

श्री सेठिया का कवि गले में अटके केवल एक ही गीत को अभिव्यक्त करने के लिए जीवन भर तुतलाता रहा है और वही भूला हुआ एक गीत का शत-शत नये गीतों के उत्स की विस्मृति बन गई। कवि ने कविता को 'सबदां' रे भारे में चन्नण री लाकड़ी' तथा 'आतमा री ओखध' समझा और कलम को "सुरसत मां' री संजीवणी जड़ी माना है जो 'परगासै आतमा री जोत अर मेटे जिनगानी रो दुंद'। और सेठिया का कवि 'ई खिण तांई सबदां रे व्यूह में अेक अदीठ जुद इकलहत्यो लड़ रयो है'। कवि सेठिया ने बहुत वर्षों पहले 'खुली खिड़कियां चौड़े रास्ते' में मंतव्य स्पष्ट किया कि "दंशित करवाता हूँ/स्वयं को/मीम भुजंगों से/जिससे मुक्त हो सकें। भले ही क्षण भर के लिए/अपने गरल से/पहुंच सके मेरे अमृत का अंश/उनके वंश के गले में भी/बदल जाए/उनकी भावीपीढ़ी/बन जाय वह/निर्विष अमृतमय।" जिससे कि 'महामौन तक पहुंचाने का माध्यम गीत-शिखाएँ बने।' कवि की कामना है कि उसका 'प्राण विहंगम सबका मंगल मेरा मंगल गाता' है। और उसके "गीतों की अमराई जीवन का श्रम-ताप हरे।" और अपने लिए कवि प्रार्थना करता है…'करो ग्रंथि से मुक्त मुझे हे वीतराग भगवन्त।'

कविवर सेठिया का काव्य विश्व मानवता का प्रतिनिधि काव्य है। वाल्ट

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

ह्विटमेन की तरह सेठियाजी ने भी मानव के गीत गाये हैं, उसके अन्तश्चेतन की अनुभूतियों को अभिव्यक्ति दी है। उसकी दुर्बलताओं को अपनी संवेदना के दर्पण में, प्रतिबिम्बित करते हुए उसे साहस-संबल दिया है। 'अग्नि वीणा' 'मेरा युग', 'दीप किरण', 'आज हिमालय बोला' से लेकर 'प्रतिबिम्ब', प्रणाम 'मर्म', 'लीलटांस', 'अनाम', 'निर्ग्रंथ', 'ताजमहल' तक मानवीय चेतना की अतल गहराइयों तथा अन्तहीन ऊंचाइयों को अभिव्यक्ति दी है। उनकी व्यापक एवं गहन संवेदना ने जीवन के समस्त स्तरों पर करुणा, प्रेम, त्याग एवं तप के रूप में सेठियाजी के जीवन में 'सब का मंगल' के रूप में अभिव्यक्ति पाई है। उनके राजस्थानी एवं हिन्दी काव्यों में यथार्थ की कराल विभीषिका से आदर्श की असीम ऊँचाइयों के स्वर मिले हैं। प्राणों से प्रभु वीतराग भगवन्त तक मानवीय चेतना की अन्तर्यात्रा के प्रचेता के रूप में सेठिया जी कवियों में एक सौम्य सन्त के रूप में कालजयी हैं। सेठियाजी का अधिकांश सृजन अध्यात्म के अमृतत्व से सिंचित होने के कारण सार्वकालिक साहित्य है और अनन्त की परिदर्शनशाला में वह युग-युग के लिए आकर्षण का केन्द्र बना रहेगा।

सेठिया के सृजनात्मक साहित्य में भारतीय मनीषा को सार्थक अभिव्यक्ति मिली है। उनका साहित्य एक छोर पर जन-जीवन की गहराई को रेखांकित करता है तो दूसरे छोर पर भारतीय चिन्तन और दर्शन का मर्म उनके काव्यों का अन्तरंग अन्तस्त है। (शब्द) वाणी और अर्थ सम्पृक्त होकर श्री सेठिया की साहित्य-यात्रा को जन-चेतना के जीवन्त यथार्थ की वीथियों में ले जाते हैं और उतने ही सहज रूप से सौंदर्य बोध के उत्तुंग गिरि-श्रृंगों पर और तत्त्वदर्शन के महासमुद्र की अतल गहराइयों तक उनका काव्य समय के प्रवाह पर मनुष्य चेतना का सेतु है।*

भारतीय दर्शन की गुरुवर विचार-परम्परा के प्रोज्जवल दीपक को सेठियाजी ने अपने साहित्य के माध्यम से चिन्तन का आंचल प्रदान कर विश्व दर्शन के क्षितिज पर सुशोभित 'रंगोली' के मध्य सजाया है। इनकी कविताओं में (अग्निवीणा, मेरा युग, आज हिमालय बोला) जो युग-चेतना के प्रमाण हैं मिनि कविताओं में (मर्म, अनाम, लीलटांस,) या नये प्रयोगों, (खुली खिड़कियां' चौड़े राते) में गद्य काव्य (गाळगचीया) के चित्रों में, इनके लेखन में सूक्ष्म चिन्तन की तड़ित् सर्वत्र आत्म रूप में व्याप्त मिलेगी। स्वतन्त्र चिन्तन का पक्षधर एवं अनासक्त स्थिति में लीन सेठिया का कवि शपथपूर्वक कहता है

मुक्त दृष्टि निरुपाधि निरंजन,
मैं विमुग्ध भी उदासीन हूँ। ('प्रणाम', पृष्ठ २७१)

हिन्‍ और राजस्थानी भाषा की चित्रात्मकता, प्रसंगानुकूलता, अर्थ शक्तिमत्ता, सेठिया की काव्य-कृतियों में परिलक्षित होती है। राजस्थान के साहित्यिक

*डॉ. लक्ष्मीमल सिंघवी : मधुमती सेठिया विशेषांक, अक्टूबर-नवम्बर, १९८३, पृष्ठ १४०

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

क्षेत्र में सेठियाजी मैथिलीशरण गुप्त के तुल्य हैं। पर खेद का विषय है कि राजस्थानी की अपेक्षा हिन्दी की अधिक सेवा करने पर भी राजस्थान के बाहर का हिन्दी संसार आपका यथोचित मूल्यांकन नहीं कर पाया है। सेठियाजी ने हिन्दी व राजस्थानी की नयी क्षमता, नई भाषा-शैली, नयी जीवन-दृष्टि, नव-संवेदना की एक नूतन भाव-गरिमा काव्य को प्रदान की। भाषा और शैली-गत नये प्रयोगों से वे आनन्दित करते हुए हिन्दी, राजस्थानी और उर्दू में काव्य कृतियों को नवीन पथ के दर्शन कराने में सक्षम हुए हैं। वे राजस्थानी एवं हिन्दी के समर्थ हस्ताक्षर के रूप में प्रतिष्ठित हैं। राजस्थान साहित्य क्षेत्र में उनकी काव्य-कृतियां अपनी उपलब्धियों में विशिष्ट एवं अप्रतिम हैं। सभी दृष्टियों से सेठिया को राजस्थान के शीर्षस्थ कवि का आसन सहज ही प्राप्त हो जाता है।

सेठिया का कवि ''आज तक की अपनी उपलब्धियों के बारे में आश्वस्त है' पर इस वाक्य के आगे विरामचिह्न नहीं लगाना चाहता और बड़ी दृढ़ता के साथ गा उठता है

मत कर धीमा गीत, अभी तो
मंजिल बहुत दूर है। ('प्रणाम', पृष्ठ ५)

श्री सेठिया चिरन्तन सत्य के चिन्तक हैं, अन्वेषक हैं और अपने विचारों की भाव-गंगा में सहृदयों को आपाद मस्तक निमग्न करने में निष्णात हैं। कवि ने अपने व्यक्तित्व और काव्य-साधना को इस प्रकार प्रतिपादित किया है···

मेरा है सम्बन्ध सभी से
सबसे मेरी स्नेह सगाई !

× × ×

मैं अखण्ड हूं, खण्डित होना
मेरे मन को नहीं सुहाता।

× × ×

सबकी पद-रज चन्दन मुझको
सबके सांस सुरभिमय कुंकुम,
सबका मंगल मेरा मंगल,
गाता मेरा प्राण विहंगम,
जीवन का श्रम ताप हरे, यह
मेरे गीतों की अमराई। ('प्रणाम', पृष्ठ ३७)

सत्यं, शिवं सुन्दरम् के गायक सेठिया के कवि की इसी में सिद्धि है, यही उसका मोक्ष है।

जयन्ति से सुकृतिनः रससिद्धाः कवीश्वराः।
नास्ति येषां यशः काये जरामरणजं भयम्॥

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

हिन्दी के समाजवादी यथार्थवादी कथा-साहित्य में रोमानी तत्त्व

(कुमारी) वर्षा मेहता

वर्ष १९८५ में पी-एच० डी० (हिन्दी) की उपाधि के लिए
जोधपुर विश्वविद्यालय द्वारा स्वीकृत शोध-प्रबन्ध का सारांश*

रोमांस जीवन का एक अंतरंग तत्त्व है। मानवीय चेतना चाहे जितनी विकसित हो जाये रूमानियत मानव का साथ नहीं छोड़ सकती। न केवल प्रेम और सौन्दर्य अपितु जीवन में किए गए प्रत्येक साहसिक कार्य में रूमानियत का हाथ होता है। किसी भी परम्परा के भंजन और नये युग की शुरुआत में रोमानी तत्त्वों का बहुत अधिक सहयोग होता है। हिन्दी के समाजवादी यथार्थवादी उपन्यासों में प्रत्यक्ष और परोक्ष दोनों ही रूपों में ये अंदाज विद्यमान हैं। भाव स्फीति, विचारों की रूमानियत, रूढ़िभंजन का आदर्श, जटिलता की जगह सरलीकरण की प्रवृति, अतिशय भावुकता—ये सारी प्रवृत्तियाँ इन उपन्यासों में विद्यमान हैं।

सम्पूर्ण प्रबन्ध को चार अध्यायों में विभाजित किया गया है। प्रथम अध्याय 'विषय प्रवेश' है। इस अध्याय को पुन: दो खण्डों में विभक्त किया गया है। प्रथम खण्ड में समाजवादी यथार्थवादी कथा-साहित्य का सैद्धांतिक स्वरुप विवेचन किया गया है। इसी खण्ड में समाजवादी यथार्थवादी कथा-साहित्य की व्यावर्तक विशेषताओं को स्पष्ट करते हुए इसकी पृष्ठभूमि को विश्लेषित किया गया है। दूसरे खण्ड में रोमानी तत्त्वों की चर्चा हुई है। संवेदनापरक, विचार-परक और अभिव्यंजनापरक रूमानियत की चर्चा क्रम में हिन्दी के समाजवादी यथार्थवादी कथा लेखन के रोमानी संस्कार को भी इसी खण्ड में स्पष्ट किया गया है। प्रेमचन्द-पूर्व का कथा-साहित्य अपने संस्कार और स्वभाव दोनों ही में रूमानियत लिए हुए है। इसके कई ऐतिहासिक कारण हैं। भारतीय साहित्य की परम्परा का मूल उत्स 'रस' है फलत: रूमानियत का संस्कार उसे विरासत में मिला है। १६१०-१५ से लेकर १६३६ तक का कालखण्ड भारत के लिए क्रान्तिकारी प्रमाणित हुआ। भारतीय जीवन में यह बड़ी बेचैनी और उथल-पुथल का युग था। भारतीय सामाजिक-सांस्कृतिक क्षितिज पर पुनर्जागरण का अभ्युदय, अंग्रेज़ी के माध्यम से यूरोपीय स्वच्छन्दतावाद से सीधा सम्पर्क तथा

---

*यह शोध डॉ. विमलचन्द्र सिंह, सह आचार्य, हिन्दी विभाग, जोधपुर विश्वविद्यालय, जोधपुर के निर्देशन में किया गया।

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

युवा पीढ़ी में रूढ़ियों के प्रति तीव्र आक्रोश—इन सबने मिल कर इस कालखण्ड को सर्वांग रोमानी संस्कार से भरा। हिन्दी कविता में भी यही कालखण्ड 'छायावाद' के नाम से अभिहित हुआ। यह एक विचित्र संयोग था कि पद्य और गद्य दोनों के समर्थ लेखक रोमानी प्रवृत्ति से आपूरित थे। उस युग के सर्वश्रेष्ठ यथार्थवादी कथा लेखक प्रेमचन्द की 'गबन' से पूर्व की सारी रचनाओं में इसी संस्कार का तीव्र स्वर अनुगुंजित हुआ है। भावातिरेक, समस्या का काल्पनिक समाधान, अतिशय आदर्शवादी रहस्य और अध्यात्म की मुद्रा, अलंकरण के प्रति आसक्ति, ललित दृश्यावली और रसिक शब्द योजना—ये सारी प्रवृत्तियाँ उस युग के कथा-साहित्य में विद्यमान हैं—कहीं कम कहीं अधिक। कुल मिला कर चौथे दशक से पूर्व का कथा-साहित्य जिसे हिन्दी कथा-साहित्य का संस्कार युग कह सकते हैं—पूरा का पूरा रोमानी प्रवृत्तियों का साहित्य है। हिन्दी के समाजवादी यथार्थवादी कथाकार रूमानियत के इस संस्कार से अपने को मुक्त नहीं कर पाए हैं।

शोध-प्रबन्ध का द्वितीय अध्याय 'समाजवादी यथार्थवादी कथा-साहित्य में संवेदनापरक रूमानियत' की छानबीन है। 'गोदान' के प्रकाशन ने हिन्दी कथा-साहित्य को यथार्थ की धरती पर खड़ा किया। ३६ के बाद क्रमशः महानगरीय, कस्बाई और ग्रामीण संवेदनाएँ इनमें रूपायित होने लगीं। इस अध्याय को क्रमशः महानगरीय, कस्बाई और ग्रामीण संवेदनाओं में बाँटा गया है।

सभ्यता-विकास का केन्द्र नगर रहा है। विकास के इस अंतिम चरण में महानगर ने अपनी सर्वोच्च सत्ता स्थापित की है। ग्राम-जीवन से नगर-जीवन की ओर उन्मुखता आज की सभ्यता की मूल प्रवृत्ति है। यह प्रवृत्ति सृजनात्मक लेखन में भी उतर आई है। आम मनुष्य महानगरों से लेकर ग्राम-जीवन तक फैला हुआ है परन्तु आज की संवेदनाएँ ग्राम जीवन से नगर जीवन की ओर उन्मुख हो गई हैं। अतएव आज के साहित्य में मनुष्य, उसका जीवन और उससे सम्बन्धित यथार्थ के सभी दृष्टिकोण रूमानियत के सीधे शिकार हुए हैं। यशपाल, राहुल, भीष्म साहनी, जगदम्बा प्रसाद दीक्षित, रज़ा आदि प्रमुख रूप से महानगरीय संवेदना के चितेरे हैं। महानगरीय सुविधाभोग के कामी कथाकारों ने जहां कहीं भी इस संवेदना को रूपायित करने का प्रयास किया है अतिरंजना के भागी हुए हैं। आज का महानगर, उसकी मिट्टी, उसका आकाश, उसके क्षितिज कहीं से भी न तो देशी हैं और न विदेशी। न उनमें परम्परा का तारतम्य है, और न आधुनिकता की वैज्ञानिक प्रणाली। बोध के स्तर पर न वे वैज्ञानिक बन सके हैं और न संवेदना के स्तर पर वे परम्परित मनुष्य रह गए हैं। फलतः समस्त महानगरीय जीवन और उसकी प्रणाली अनेकानेक विसंगतियों से भर गई है। ये विसंगतियाँ ही महानगरीय जीवन की वास्तविकता बनती जा रही हैं परन्तु इन विसंगतियों में ही एक ऐसा कृत्रिम चाव, अति उत्साह, उसकी प्राप्ति की आपाधापी, उसके लिए ललक आदि प्रक्रियाएँ इतना संगीन और संकुल होकर विकसित हुई हैं कि इनमें क्या भ्रम और क्या

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

वास्तविकता, पहचान कठिन हो गई है। अतिरंजना, स्फीति और सरलीकरण के माध्यम से इन कथाकारों की महानगरीय संवेदनाएँ भारी रूमानियत की शिकार हुई हैं।

इसके पश्चात् 'कस्बाई संवेदनाओं' की चर्चा की गई है। हिन्दी कथा-साहित्य की सृजनात्मकता में जो एक रोमानी आवेग आया था उसकी लहर से समाजवादी यथार्थवादी कथा-साहित्य भी बच नहीं पाया। यह तथ्य है कि प्रेमचन्द ने सम्पूर्ण कथा-मानस को पहली बार निम्न वर्ग से जोड़ा। खेतिहर किसान, खेतिहर मजदूर तथा इसी तरह के अन्य शोषित वर्ग के जीवन को उन्होंने कथा-साहित्य का उपजीव्य बनाया। फलतः ग्राम्य और कस्बाई संवेदनाएं बाद के कथा-साहित्य में प्रमुख स्थान पाने लगीं। समाजवादी यथार्थवादी कथाकारों की सृजनात्मक भूमि का बीज प्रेमचन्द ने डाला था। यही कारण हुआ कि कस्बाई संवेदनाओं ने इनके कथा-साहित्य में महत्त्वपूर्ण स्थान का निर्माण किया। कस्बाई जीवन सामाजिकता की दृष्टि से एक प्रकार का संकुल जीवन-आधार को लेकर आगे बढ़ता है। कस्बाई जीवन एक प्रकार से संक्रान्ति जीवन का आदर्श होता है, जहाँ एक ओर ग्राम्य जीवन की सहजता, स्वच्छता, सरलता और नैसर्गिकता होती है, वहाँ उनमें दूसरी ओर नगर जीवन का चाक्चिक्य, वाह्‌य आडम्बर, दोहरी जीवन प्रणाली के प्रति एक द्वन्दात्मक स्थिति होती है। श्रीलाल शुक्ल, मन्नू भंडारी, राही मासूम रज़ा, पानू खोलिया एवं राजेन्द्र यादव के कथा-साहित्य में कस्बाई संवेदनाओं की प्रधानता है। इन कथा लेखकों की संवेदनाएँ कहीं अतिरंजना की शिकार हैं, कहीं भाव स्फीति की मुद्रा लिए हुए हैं और कहीं भयावह सरलीकरणों में उलझ कर आत्मतृप्त हो गई है। कस्बाई संवेदनाओं की रूमानियत का एक पक्ष रचना में बढ़ती सपाट बयानी से भी जुड़ा है। इनकी सपाट बयानी सतही एवं यांत्रिक बखान का पर्याय बन गई है। कहीं-कहीं उनकी तथाकथित कस्बाई संवेदना अतीत प्रेमी होकर रूमानियत में परिणत हो गई है। यथार्थ के प्रति रुझान, वस्तुस्थिति की सही समझ, साहित्य के प्रति सुनिश्चित उद्देश्य और जनजीवन के प्रति प्रतिबद्ध होते हुए भी कस्बाई संवेदनाओं के अवतरण में कई स्तरों पर इन्हें भी रूमानियत का शिकार होना पड़ा है।

इस अध्याय का तीसरा भाग 'ग्रामीण संवेदनाओं' से संबंधित है। नागार्जुन, भैरवप्रसाद गुप्त, रांगेय राघव, मणि मधुकर, मार्कण्डेय आदि के कथा-साहित्य में ग्राम्य संवेदनाओं को प्रमुखता मिली है। यथार्थ के नाम पर ग्राम्य संवेदनाओं को एक सशक्त तत्त्व के रूप में उभारने की भरपूर कोशिश इन कथाकारों ने की किन्तु नागार्जुन जैसे रचनाकारों को छोड़कर अधिकांश कथाकार वस्तुतः उस संवेदना से परिचित ही नहीं थे। महानगरों में उत्पन्न नवीन बूर्ज्वाई संस्कारों में वे पले थे। आधुनिकता के नाम पर उनमें एक नया रूमानी संस्कार जन्मा था। अतः फैशन के रूप में यथार्थ के नाम पर ग्राम्य संवेदनाओं को उन्होंने उपजीव्य तो बनाया परन्तु उसकी यथार्थता से

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

अपरिचित होने के कारण उसके वास्तविक स्वरूप को रखने में वे असफल हो गए। मणि मधुकर ने तो ग्राम से दूर ढाणी विशेष को अपने सृजन का आधार बनाया है। इनकी ग्राम्य संवेदनाएँ न केवल यथार्थ के छद्म रूप में उजागर हुई है अपितु ऐसी रचनाएँ एक घटिया किस्म की रूमानियत का अभूतपूर्व ढंग से शिकार भी हुई है। भयावह प्रतीक एवं चौंकाने वाली बिम्ब मालाएँ भी इस तथ्य को नहीं छिपा पातीं कि उनका भाव बोध अतिरंजना और स्फीति पर आधारित है। उनकी मूल ग्रामीण भावुकता उनके तथाकथित महानगरीय बोध के सामने तनावपूर्ण न होकर दरअसल अधिक सतही और लिजलिजी हो गई है। ये फैशनपरस्त, यथार्थ के चहेते, महानगरीय सुविधा के भोगी रचनाकारों ने जहाँ एक ओर रेणु बनना चाहा, वहीं दूसरी ओर नागार्जुन, किन्तु ये दोनों तो बन ही नहीं सके, बन सकते भी नहीं, जो कुछ बने वह यथार्थवादी तो कहीं भी नहीं रहे और चाहे जो कुछ भी हों। उन्होंने ग्राम्य संवेदनाओं को अपने स्वीकृत मूल्यों के आधार पर व्याख्यायित किया है। ग्राम्य शिक्षा के सतहीपन, शहरों की जगमगाहट, पाश्चात्य कथा-साहित्य का प्रभाव एवं ग्रामीण संस्कृति के शहरीकरण ने अनायास ही इनके कथा-साहित्य के यथार्थ को रूमानियत में बदल दिया है। कहने का आशय यह कि ग्राम-संवेदनाओं की सह-अनुभूति के अभाव में वे जो कुछ दे गए वह सम-अनुभूति उत्पन्न करने में अक्षम होकर हास्यास्पद हो गई।

तृतीय अध्याय 'समाजवादी यथार्थवादी कथा-साहित्य में विचारपरक रूमानियत से सम्बन्धित है। इस अध्याय का प्रारम्भ साहित्य और विचार के सम्बन्ध को स्पष्ट करते हुए किया गया है। इसके बाद विचार और विचारधारा में अंतर को बताया गया है। यहीं पर साहित्य में विचार अथवा विचारधारा के प्रवेश की विवेचना हुई है। इसी क्रम में साहित्य में विचारधारा के प्रति प्रतिबद्धता के प्रश्न की चर्चा की गई है। इसके बाद विचार के अवतरण का इतिहास संक्षेप में रेखांकित किया गया है। १९ वीं शताब्दी के यथार्थवादी आन्दोलन ने साहित्य में विचार के प्रवेश का रास्ता खोला। युग की इस नवीन मानव केन्द्रित चेतना के पीछे औद्योगिक क्रान्ति, फ्रांसीसी राज्य क्रान्ति, वैज्ञानिक विकास और जनतान्त्रिक विचारधारा का महत्त्वपूर्ण योगदान रहा है। यही वह युग था जब यथार्थवाद का जन्म स्वच्छन्दतावाद की क्रोड़ में हो रहा था। प्रायः प्रत्येक यथार्थवादी आन्दोलन की पृष्ठभूमि में स्वच्छन्दतावाद की भूमिका रही है। स्वच्छन्दतावाद की रूमानियत विकास क्रम में वैज्ञानिकता और बौद्धिकता का आधार पाकर यथार्थ का स्वरूप ग्रहण करती है। तात्पर्य यह कि यथार्थ और रूमानियत का एक ऐसा अन्तः सम्बन्ध है जो विवश करता है यह सोचने को कि इन दोनों को एक दूसरे से विलगा कर न देखा जाए। युग के क्षितिज पर मार्क्स और फ्रायड इन दो प्रमुख चिन्तकों का आविर्भाव हुआ। मार्क्स ने बहिर्जगत को चिन्तन का विषय बनाया, फ्रायड ने अन्तर्मन को टटोला। यद्यपि समाजवादी यथार्थवादी कथाकारों ने चिन्तन के स्तर पर फ्रायड और उसके

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

R
016
UNI-A·2

सिद्धान्त को विरोधी सिद्धान्त के रूप में सामने रखा किन्तु सर्जन की व्यावहारिकता में फ्रायडवाद के आतंक से वे बच नहीं पाए हैं। दूसरी ओर मार्क्सवाद के प्रति इनकी प्रतिबद्धता ने फैशन का रूप ले लिया है। इन कथाकारों की वैचारिक रूमानियत का अध्ययन 'फ्रायडवाद' और 'मार्क्सवाद' शीर्षक के अन्तर्गत किया गया है।

690

व्यावहारिक स्तर पर यह निःसंकोच कहा जा सकता है कि विचार और विचारप्रणाली दोनों के प्रति सर्वाधिक प्रतिबद्धता मार्क्सवादी कला सर्जकों में है। समाजवादी यथार्थवादी कृतिकारों ने जीवन के बहिर्यथार्थ को उसके बहिर्वस्तुजगत को तो बहुत अधिक महत्त्व दिया किन्तु व्यक्ति के अन्तर्जगत के प्रति वे उदासीन रहे। चिन्तन के स्तर पर व्यक्ति अन्तर्मन के विश्लेषक फ्रायड और उसके सिद्धान्त को विरोधी सिद्धान्त के रूप में सामने रखा गया। इन्होंने मनोवैज्ञानिक यथार्थवाद को 'छद्म यथार्थ' की संज्ञा से विभूषित किया। मार्क्सवाद जहाँ बहिर्जगत को महत्त्व देता है वहीं फ्रायडवाद अन्तर्जगत को। एक में समाज प्रधान है, दूसरे में व्यक्ति। एक में सचेतनता की मुख्य भूमिका है, दूसरे में अवचेतन की और इस तरह वे दोनों एक-दूसरे के विरोध में खड़े हुए जबकि सत्य यह है कि व्यक्ति और समाज, अन्तः और बहि, चेतन और अचेतन एक दूसरे के सम्पूरक हैं। दोनों का सम्बन्ध अन्योन्याश्रय है। एक के अभाव में दूसरे के पाँव टिकने की बात असम्भव-सी लगती है। हिन्दी के समाजवादी यथार्थवादी कथाकारों ने मनोवैज्ञानिक यथार्थ को सम्पूरक न मान कर उसे विरोधी माना लेकिन सर्जन की व्यावहारिकता में आकर सजग और सचेतन रहने के बावजूद वे भयानक अंतर्विरोध के शिकार हुए। सामाजिक यथार्थ के साथ वैयक्तिक यथार्थ, बहिर्जगत के साथ अन्तर्जगत और सचेतनता के साथ अवचेतन ने ऐसा घुला-मिला रूप सामने रखा कि इन कथाकारों की पक्षधरता जहाँ की तहाँ रह गई और वे भयावह रूप से रूमानियत के शिकार हुए।

फ्रायड का मनोविज्ञानवाद काम एवं अहं की आधारभूमि पर खड़ा है। अतएव 'कामचेतना' एवं 'अहं' शीर्षक के अन्तर्गत इन कथाकारों के फ्रायडवाद पर विचार किया गया है। इन कथाकारों के यहाँ नर-नारी के लैंगिक सम्बन्धों पर खुल कर विचार हुआ है। इनके यहाँ काम प्रेम के साथ आया है। काम का स्पर्श पाकर प्रेम सृजनशील हो जाता है। ये कथाकार नर-नारी के आकर्षण की मूल प्रेरणा सेक्स को मानते हैं। इन कथाकारों की मान्यता है कि शरीर रहते कामगत चेष्टाओं की अवहेलना नहीं की जा सकती, अतएव यौन वफादारी को तिलांजलि देने में वे नहीं हिचकते। अपने प्रेमी पात्र की ग्रन्थि खोलने के लिए इनकी कथा नायिकायें अपना शरीर-दान करने में ही भलाई समझती है। काम भावना का दमन करने पर वह विकृत रूप ले लेती है। कहीं वह जड़त्व, कहीं बद्धत्व और कहीं पशु रति का रूप ले लेती है। ये काम विकृत्तियाँ समाजवादी यथार्थवादी कथा-साहित्य में विद्यमान हैं। 'अहं' शीर्षक के अन्तर्गत अहं की सुरक्षात्मक प्रविधियाँ जैसे संक्षेपण, आरोपण, विस्मरण,

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

क्षतिपूर्ति आदि को खोजा गया है जिसका भरपूर उपयोग इनके कथा-साहित्य में हुआ है। सैद्धांतिक स्तर पर फ्रायडवाद को नकारते हुए भी व्यवहार में इसकी वैचारिकता मनोविश्लेषण का सम्बन्ध पाकर रूमानियत में परिवर्तित हो गई है। सृजन के स्तर वे फ्रायडवाद के आतंक से अपने को मुक्त नहीं रख पाए हैं। यशपाल का कथा-साहित्य इसका अप्रतिम उदाहरण है।

समाजवादी यथार्थवादी कथाकारों के वैचारिक रूमानियत का दूसरा उदाहरण 'मार्क्सवाद' शीर्षक के अंतर्गत विवेचित किया गया है। २०वीं शताब्दी के चौथे दशक में जब वाम चिन्तन ने अपना वर्चस्व स्थापित किया, यथार्थ ने आदर्श के छद्मों को तोड़ा; रूढ़ि, जड़ता, अन्धविश्वास जैसी अबौद्धिकता पर प्रश्नचिह्न लगे तो अनेक रचनाकारों ने वाम चिन्तन के पक्षधर न होते हुए भी उसे फैशन के स्तर पर अपने सर्जन में उतारा। प्रतिबद्धता आस्था की वस्तु है। पक्षधरता में निष्ठा काम करती है। यह फैशनपरस्त यथार्थ-वादी लेखकों का छद्म रचना के स्तर पर उसे बार-बार रूमानियत की ओर झोंकता रहा और यथार्थ के परिधान में ढक कर जिस वस्तुजगत का ये लेखक अवतरण करते रहे बहुत शीघ्र उसका असली स्वरूप प्रगट होता गया और इनकी यथार्थता न आदर्शवादी रही, न रोमानी अपितु एक ऐसे छद्म से आवेष्टित दिखी कि उनकी रचना रचना रूप में भी अपनी पहचान गँवा बैठी। इस क्षेत्र में एक और ऐतिहासिक बात का उल्लेख होना चाहिए वह यह कि भारत में और विशेषकर हिन्दी जगत में आधुनिकता आई तो किन्तु उससे प्रसूत आधुनिक बुद्धि आने से रह गई। विज्ञान और तकनीकी ज्ञान व्यावसायिकता का शिकार हुआ फलतः वैज्ञानिक सोच जन्म लेने से पूर्व ही समाप्त हो गई। आधुनिकता फैशन तक ही रह गयी। उसका संस्पर्श बाह्य ही रहा। वैचारिकता को प्रभावित करने की भूमिका वह रच नहीं पाई। यही कारण हुआ कि इस कालखण्ड के बाद का भारत और उसका मानस अनेकशः अंर्तविरोधों का शिकार हुआ। यथार्थ के छद्म में जो रूमानियत पनपी उसका संस्कार भी शुद्ध रोमानी नहीं रहा। यथार्थ का छद्म तो था ही, रोमानियत का छद्म भी अवतरित हुआ। युग की इसी चेतना ने पाँचवें दशक से लेकर अब तक के कथा-साहित्य में प्रवेश पाया और इस घातक कुप्रभाव का शिकार विशेष रूप से तथाकथित समाजवादी यथार्थवादी लेखक हुए जिनकी वैचारिकता यथार्थपरक तो रही ही नहीं रोमानी भी नहीं रही। यशपाल, मार्कण्डेय, नागार्जुन, भैरवप्रसाद गुप्त, राहुल सांकृत्यायन इसके सर्वाधिक शिकार हुए हैं। इन कथाकारों की वैचारिक प्रतिबद्धता चालू तनावहीन मुहावरों, सरलीकरणों एवं सामान्यीकरणों से आक्रांत है। उनके समग्र कर्म की संरचनात्मक मुद्रा 'छद्म आभिजात्य' की है जिनमें आत्मस्फीति, आरोपित दार्शनिकता का लटका और सामयिक यथार्थ के मानवीय सम्बन्धों से नितान्त बेरूखी है। इनके यहाँ उग्रता का उधार लिया हुआ तेवर, नकली गुस्सों के पेबन्द और बड़बोला विद्रोह ही अधिकांश रहा है। विचारधारा के प्रति प्रतिबद्धता फैशन के स्तर पर होने के कारण इनमें चालू ढ़ीला मुहावरा और

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

सतही बौखलाहट आ गई है। इन कथाकारों के यहाँ क्रान्ति एक मजाक बन कर रह गई है और आम आदमी का वाजिब गुस्सा भी काठ हुआ है। वर्ग वैषम्य, श्रम की महत्ता, उपनिवेशवाद का विरोध आदि को लेकर उन्होंने समकालीन आदमी की विवशताओं से आँख मूँद कर वक्तव्यबाजी की है। वे चौंकने का जतन तो करते हैं किन्तु अपने शराफत के घेरे नहीं तोड़ पाते। स्त्री-पुरुष सम्बन्ध आत्मलिप्त पुरुषत्व की उद्घोषणा बन कर रह गए हैं। कहने का अर्थ यह कि मूल्य संक्रमण के जिस चौराहे पर यथार्थ की नंगी चुनौतियों को जिस गम्भीरता से स्वीकारना था प्रतिबद्धता के बावजूद समाजवादी यथार्थवादी कथा लेखन में कम है। नकली नपुंसक आक्रोश, सतही बौखलाहट, फिजूल का बड़बोलापन, नारेबाजी, लफ्फाजी, पैगम्बर मुद्रा—ये इनकी वैचारिक रूमानियत के शिनाख्ती निशान हैं।

शोध-प्रबन्ध का चतुर्थ अध्याय 'समाजवादी यथार्थवादी कथा-साहित्य का रोमानी अभिव्यंजना शिल्प' है। इस अध्याय का प्रारम्भ औपन्यासिक अभिव्यंजना शिल्प के अभिप्राय और स्वरूप की सैद्धांतिक विवेचना से किया गया है। शिल्प और उसका अर्थ, कथा-शिल्प की मूलभूत समस्याएँ एवं कथा-शिल्प की प्रविधियों की भी चर्चा की गई है। शिल्प की रूमानियत को स्पष्ट करते हुए यह स्थापना की गई है कि समाजवादी यथार्थवादी कथाकारों ने जब-जब शिल्प के प्रति या तो अधिक सजगता दिखाई, या फिर प्रतिक्रिया के स्तर पर शिल्प निर्माण के लिए कृत्रिम प्रयास किया, तब-तब शिल्प का रोमानी स्वरूप उभर कर सामने आया। इस स्थापना का व्यावहारिक अध्ययन कथानक सृष्टि, चरित्र सृष्टि, वातावरण सृष्टि और अभिव्यंजना सृष्टि के संदर्भ में हुआ है।

सर्वप्रथम कथानक सृष्टि में रूमानियत को परखा गया है। कथा-साहित्य मूलतः गल्प है यानि कथानक की भूमिका उसकी सबसे बड़ी विशेषता है। वस्तु-जगत का यथार्थ प्रेरक बन कर रचनाकार के अन्तस् में जब प्रवेश करता है तो वह मांग करता है कि कथाशिल्पी उसकी पुनर्रचना करते समय उसकी वास्तविकता को खण्डित न करें। जब तक कथाकार बहिर्जगत की प्रेरक वस्तु की संरचना में या उसकी अभिव्यक्ति में अतिशय सजगता, कृत्रिमता और महत् उत्साह का परिचय नहीं देता तब तक तो कथानक सृष्टि का शिल्प यथार्थपरक रह जाता है किन्तु ज्योंहीं इस दिशा में लेखक अधिक सावधान होने लगता है, त्यों-त्यों कारीगरी बढ़ने लगती है, कृत्रिमता का प्रवेश होने लगता है और अन्ततः यथार्थवादी वस्तु को आधार मान कर की गई कथानक सृष्टि भी सस्ती रूमानियत का शिकार हो जाती है। समाजवादी यथार्थवादी कथा साहित्य की कथानक-सृष्टि कृत्रिमता, आवेग, स्फीति, पुनरावृत्ति, आरोपण, अर्थ विस्तार, सूचनात्मकता, संयोगों पर बल, हत्याओं की अधिकता, रहस्य एवं रोमांच, तिलस्मी जासूसी उपन्यासों की-सी सस्ती कल्पना, सरलीकरण आदि के माध्यम से रूमानी हो गई है। हिन्दी उपन्यास लेखन में १९२८ ई० से लेकर १९३६ ई० तक का कालखण्ड या प्रकारान्तर से चौथा दशक जिन कई अर्थों में क्रान्तिकारी प्रमाणित

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

हुआ, उनमें एक यह है कि कथानक के स्थान पर चरित्र ने कथालेखन के केन्द्र में अपने लिए स्थान बनाया। समाजवादी यथार्थवादी उपन्यासों में चरित्र सृष्टि की जिस प्रणाली को सिद्धान्त के रूप में अंगीकार किया गया है, वह प्रणाली बहुत दूर तक जाकर यदा-कदा जड़ता का स्थान ले लेती है, सम्प्रदाय का स्थान ले लेती है। इसमें पात्रों की अन्तःता लगभग छूट-सी जाती है। ठीक इसी तरह मनोवैज्ञानिक उपन्यासों में चरित्र सृष्टि की जो विधि काम में ली जाती है, वह अन्तः के परतों को तो खोल देती है लेकिन बहिर्जगत के प्रति उसका व्यवहार इतना अटपटा हो जाता है कि वह पात्र असामान्य-सा लगने लगता है। ये दोनों ही प्रणालियाँ, दोनों ही जगह एक प्रकार की रूमानियत का प्रतिफल है। वास्तविकता से यद दोनों ही जगह पलायन है। कहने का आशय यह कि वास्तविकता को रचना की मूलाधार घोषित करने वाला समाजवादी यथार्थवादी रचनाकार भी जब इस रूमानियत का शिकार होता है तो उनकी कला में भी वास्तविकता की जगह वास्तविकता का आरोपण ही उभर जाता है। दूसरी बात यह है कि यथार्थ या वास्तविकता अपने आप में सापेक्षित अर्थ रखती है। रचनाकार स्वयं जिस संस्कार की पूँजी लेकर रचना क्षेत्र में उतरता है उसकी भी एक अलग वास्तविकता होती है। अगर सामाजिक परिवर्तनों के समानान्तर रचनाकार का निजी संस्कार भी परिवर्तित होता जाता है तब तो चरित्र को रचने की उसकी समझदारी वास्तविकता के निकट होती है परन्तु ऐसा होता बहुत कम ही है। रचनाकार जिस वर्ग का प्रतिनिधित्व करता है उसका वर्गीय संस्कार इतर वर्गीय संस्कार को अनुभूति के स्तर पर कितना अधिक न्यायसंगत भावन कर सकता है और फिर अभिव्यंजना के समय अपनी उस अनुभूति को कितना अधिक वैज्ञानिक रूप दे सकता है, यह सब इस बात पर निर्भर करता है कि इतर वर्गीय चरित्र को किस रूप में समझता है, किस रूप में उसके प्रति संवेदना व्यक्त कर सकता है या फिर उस वर्ग के साथ सहानुभूति की स्थिति किस सीमा तक बना सकता है। इस क्षेत्र में सर्वांग सफल नहीं होने के कारण अधिकांश समाजवादी यथार्थवादी कथा लेखकों ने चरित्र सृष्टि में वास्तविकता की जगह रूमानियत का अंदाज प्रस्तुत किया है। २० वीं शताब्दी के मानस को मार्क्स और फ्रायड दोनों ने एक साथ आन्दोलित किया। परिवर्तित चेतना अत्याधिक सचेत और सजग रहने के बावजूद एक दूसरे से प्रभावित होती रही या एक दूसरे के क्षेत्र में आती-जाती रही। परस्पर विरोधी चिन्तनजगत में किन्हीं भी कारणों से ऐसा प्रवेश अनायास चरित्र-सृष्टि की दिशा में एक रूमानियत की रचना कर जाता है जिसके शिकार यशपाल जैसे प्रतिबद्ध लेखक भी हुए हैं। इन कथाकारों की चरित्र सृष्टि की रूमानियत की विवेचना इनके कथा-साहित्य में चित्रित प्रमुख पुरुष एवं स्त्री पात्रों के माध्यम से की गई है। ये कथा लेखक कालजयी चरित्र देने में अक्षम रहे। इनके पात्र क्रान्ति, आदर्श समाज, स्त्री स्वाधीनता आदि की बात करते हैं किन्तु वे वास्तविक नहीं लगते। इन कथा लेखकों के प्रमुख चरित्र अंत में मृत्यु को प्राप्त हो गए हैं।

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

सर्जन की दृष्टि से यथार्थवादी परम्परा के चिन्तक वातावरण को सबसे अधिक महत्त्व देते हैं। यह वास्तविकता भी है कि कथानक में आयी हुई घटनाओं और उपघटनाओं का क्रीड़ा स्थल भी वातावरण ही होता है। पात्रों की चारित्रिक स्थितियों के निर्धारण की पृष्ठभूमि वातावरण की रचना है और माध्यम सृष्टि के सारे आवयविक उपादान वातावरण ही निर्मित करता है। पाँचवें दशक से लेकर अब तक के कथा विकास में रेखांकित करने योग्य एक महत्त्वपूर्ण बात यह है कि जीवनगत जटिलताएँ अपनी समग्रता में स्थान तो प्राप्त कर गयी हैं लेकिन इन जटिलताओं को रूपायित करने में समझदारी का बहुत अधिक अभाव देखा गया है। यद्यपि लेखक अपने वातावरण की ही उपज हुआ करता है किन्तु उस वातावरण के प्रति उसकी समझदारी और ईमानदारी दोनों ही इस बात पर निर्भर करती है कि उस लेखक का दृष्टिकोण कैसा है। उसमें कितनी सफाई है। अपने दृष्टिकोण को विकसित करने की उसमें कितनी आकांक्षा है और, उस आकांक्षा का प्रतिफलन अपनी रचनाओं में वह किस सीमा तक कर सका है। समाजवादी यथार्थवादी लेखन में वातावरण सृष्टि की यह सार्थकता बहुत कुछ प्रश्नवाचक चिन्ह लिए हुए है। अपने संस्कार, रचना वस्तु के प्रति विशेष उत्साह, वैचारिक स्थापना की अतिशयता, अनुकरण की अंध प्रवृत्ति इन सबके कारण वातावरण सृष्टि के क्षेत्र में इन लेखकों ने अतिशय रूमानियत का परिचय दिया है। वास्तविकता को वास्तविक रूप में प्रस्तुत करने के लिए जिस वातावरण का सृजन किया गया है उसका स्वरूप वास्तविक न होकर रूमानी हो गया है। ये कथाकार सामाजिक सच्चाई का बयान अबोध भाव से करने लगते हैं। इनकी कृति का परिवेश हमारी संवेदना वितृष्णा के गहरे सरोकार के स्तर तक उठा पाने में पूर्णतया लड़खड़ा गया है। इनके यहाँ परिवेशगत चित्रण फार्मूलाबद्ध है। युद्ध, क्रान्ति, आन्दोलन आदि समाज में व्यापक परिवर्तन लाने में महत्त्वपूर्ण योग देते हैं। इन कथाकारों ने इन सबका व्यक्ति के मन और आचरण पर पड़ने वाले मनोवैज्ञानिक प्रभावों का विस्तार से विश्लेषण किया है। समग्रतः ये कथाकार वातावरण सृष्टि और वातावरण चित्रण में भयंकर रूमानियत के शिकार हुए हैं।

कथानक, चरित्र और वातावरण सृष्टि में रूमानियत की चर्चा के उपरान्त अभिव्यंजना-सृष्टि में रूमानियत की चर्चा की गई है। कला-सृष्टि में युग-चेतना एक ऐसी अवधारणा है जिसके अन्तर्गत यह माना जाता है कि कला-वस्तु के वास्तविक स्वरूप के अनुरूप ही माध्यम का स्वरूप बदल जाता है। यों संस्कार से भी कथा-साहित्य वस्तु और रूप दोनों ही में ज्यादा यथार्थपरक है किन्तु हिन्दी कथाकारों में अधिकांश में आज भी बहुत कुछ संस्कार की रूमानियत है। मेरा अब तक का विवेचन यह प्रमाणित कर चुका है कि हिन्दी के समाजवादी यथार्थवादी कथाकार संवेदना, विचार, वातावरण इन सबकी सृष्टि में वस्तु स्तर पर बहुशः रूमानियत के शिकार हुए हैं। अतः यही निष्पति दूसरी निष्पति को जन्म देती है कि माध्यम सृष्टि में भी इनका रोमानी होना आवश्यक है।

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

माध्यम सृष्टि में अभिव्यंजना प्रसाधन का बहुत अधिक महत्त्व है। उन्होंने अपने कथा-लेखन में प्रायः सभी इन्द्रीय ग्राह्य विषयों के चित्र देने की चेष्टा की है। इस प्रयास में इसके चित्र कृत्रिम हो गए हैं। बिंबबहुलता दृश्यों को रूमानियत में बदल देती है। इनके यहाँ प्रतीक भयावहता की मुद्रा लिए हुए हैं। अतर्कित आत्मस्फीति एवं बिम्बों की फिजूलखर्ची भी इनमें प्रकट होती है। इन कथाकारों ने मुठ्ठी भर-भर के अलंकारों को लुटाया है। जहाँ एक उपमा से काम चल सकता है वहाँ कई उपमानों को जुटाया है। ये कथाकार अपने को चालू मुहावरों से सुरक्षित नहीं रख पाए हैं। इनका मुहावरा उग्र है किन्तु उसमें नाटकीयता का अभाव है। इनकी भाषा कृत्रिमता लिए हुए है जिसमें अनावश्यक ब्यौरों की भरमार है। ये उद्धरण योग्य चौंकाने वाले वक्तव्य देने के लिए उतावले हैं। इनकी भाषा अकारण गुस्सा दिखाती है। इनके इन विभिन्न रोमानी अंदाजों से जहाँ सप्रेषण में बाधा उपस्थित हुई है वहीं प्रभावक्षमता भी क्षतिग्रस्त हुई है।

कुल मिलाकर यह कहा जा सकता है कि यद्यपि समाजवादी कथा-साहित्य की यथार्थता तो खण्डित नहीं हुई है परन्तु संवेदना, विचार और अभिव्यंजना तीनों ही स्तरों पर ये रचनाकार अभूतपूर्व ढंग से रूमानियत के शिकार हुए। परन्तु इससे इस कथा-साहित्य की संभावना कहीं भी बाधित-सी होती हुई नजर नहीं आती बल्कि यह रोमानियत तो इन कथा लेखकों की विभेदक विशेषता बन गई है।

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

छायावाद कालीन प्रमुख हिन्दी उपन्यासों में युग-चेतना

(कुमारी) इन्द्रा रानी माथुर

वर्ष १९८५ में पी-एच० डी० (हिन्दी) की उपाधि के लिए
जोधपुर विश्वविद्यालय द्वारा स्वीकृत शोध-प्रबन्ध का सारांश*

युग-चेतना एक अवधारणा है। युगीन भावनाओं में से रचनाकार जब लोक-मंगल को साध्य मानकर उनमें से कुछ का चयन करता है, जिनकी उपादेयता और उद्देश्यमूलकता असंदिग्ध होती है तो वह युग-चेतना की संज्ञा से अभिहित होती है। तात्पर्य यह कि चेतना में चयन की प्रधानता होती है। वहां विवेक की प्रमुख भूमिका होती है। साहित्य-रचना की संचेतना ही इसके मूल में होती है।

युग-भावनाओं को विवेक से आंक कर रचनाकार जब उनमें से कुछ का चयन करता है तो वह इस बात के प्रति पूर्णतः सचेष्ट और सचेत रहता है कि युग-निर्माण की भूमिका में इन भावनाओं की कितनी अधिक संभावनाएं हैं। कालजयी साहित्य की रचना-प्रक्रिया के उद्‌गम में इसी चयन-वृत्ति का कौशल प्रमुख होता है। ऐसी ही रचनाएं युग-चेतना का वाणी-विधान करती हैं।

२०वीं शताब्दी के पहले दशक से लेकर चौथे दशक तक का कालखंड हिन्दी में छायावादी संज्ञा से जाना जाता है। इस कालखण्ड को स्वच्छन्दतावाद भी कहा गया है। यह तथ्य है कि कविता की दृष्टि से यह कालखण्ड मूलतः रूमानियत लिए हुए रहा। हालांकि राम की 'शक्ति पूजा' (निराला) 'ग्राम्या' (पन्त) 'कामायनी' (प्रसाद) आदि के प्रकाशन का श्रेय भी इसी कालखण्ड को है जिनमें रोमानी संस्कार ने यर्थार्थ का आधार ग्रहण किया है। गद्य और विशेषकर कथा साहित्य ने तो इसी कालखण्ड में आदर्श और रूमानियत का साथ लगभग छोड़ सा दिया। जिस प्रसाद ने 'आँसू' और 'लहर' की रचना की, 'कंकाल' और 'तितली' भी उसी की रचना है। निराला ने तो अपने कथा-साहित्य में यथार्थ की आधार भूमि ही निर्मित कर दी। प्रेमचन्द भी सुधारवाद से समाजवादी यथार्थवाद की ओर आये। प्रेमचन्द का 'गोदान' और

*यह शोध डॉ० चेतन प्रकाश पाटनी, सह आचार्य, हिन्दी विभाग, जोधपुर विश्वविद्यालय, जोधपुर के निर्देशन में किया गया।

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

जैनेन्द्र के 'परख', 'त्यागपत्र' और 'सुनीता' का रचनाकाल भी यही है। आशय यह कि इन कथाकारों ने जहां एक ओर अपनी मिट्टी की मांग को अंगीकार किया, वहीं यूरा की वैचारिक क्रांतियों से भी सम्यक् लाभ उठाया। यों कहें कि १९४० तक आते-आते संपूर्ण भारत की चेतना ही यथार्थ की ओर उन्मुख हो रही थी। इन कथा लेखकों ने उस युगीन चेतना को वाणी देने में कहीं भी कंजूसी नहीं की है। इन रचनाकारों की रचना में हम उस युग को सर्वांग रूप में पा सकते हैं जिनमें जहां एक ओर राष्ट्रीय वैचारिकता है वहीं अन्तर्राष्ट्रीय वैचारिकता का प्रभाव भी है। इसीलिए इस कालखण्ड का कथा साहित्य एक ऐसी विरासत दे गया है जिस पर हिन्दी ही नहीं, हिन्दुस्तान को भी गर्व है।

यह शोध-प्रबन्ध छः अध्यायों में विभक्त है।

प्रथम अध्याय : परम्परा और पृष्ठ भूमि

इस अध्याय के अंतर्गत सर्व प्रथम परंपरा का अर्थ और उसका महत्त्व स्पष्ट किया गया है। फिर परंपरा और पृष्ठ भूमि में तथा परंपरा और युग-भावना में भी अन्तर स्थापित किया गया है। तत्पश्चात् युग-भावना से युग-चेतना को विलग कर युग-चेतना के स्वरूप पर विचार किया गया है। यों अध्याय प्रारंभ होने से पूर्व प्रावकथन में भी युग-चेतना की अवधारणा को स्पष्ट किया गया है। अंत में छायावाद युग के पूर्ववर्ती उपन्यासों में युग-भावना के होने या न होने पर भी विचार किया गया है। क्योंकि कोई भी परंपरा अपनी प्राचीनता से ही निरंतर विकसित होकर किसी कालखंड में अपना स्वरूप ग्रहण करती है।

अध्याय के दूसरे खंड में पृष्ठ भूमि शीर्षक के अंतर्गत तद्युगीन सामाजिक, सांस्कृतिक, राजनीतिक और आर्थिक परिस्थितियों की सर्वांग परीक्षा की गई है और फिर उस निष्कर्ष की ओर कदम बढ़ाया गया है कि कैसे पुनर्जागरण युग की सुधारवादी प्रवृत्तियों ने धीरे-धीरे आधुनिकता की ओर कदम बढ़ाया। सुधारवाद का आदर्श क्रमशः यथार्थ में परिवर्तित हुआ। परंपरा और पृष्ठ भूमि का यह अध्याय वस्तुतः प्रबन्ध का विषय-प्रवेश है। अध्ययन का मौलिक प्रतिफलन तो प्रारंभ हुआ है—अध्याय दो से।

द्वितीय अध्याय : राजनीतिक और सामाजिक चेतना

आज मनुष्य जीवन के बहुआयामी विकासों का नियामक राजनीति है। साहित्यकार भी सामाजिक प्राणी होने के नाते राजनीति से अपने को अलग नहीं रख सकता है। फलतः उस चेतना की सजगता उसमें और भी अधिक होती है। इसीलिए आज का कोई भी रचनाकार राजनीतिक चेतना से अपने

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

को विलग रख ही नहीं सकता। कोई भी रचना इससे तटस्थ होकर अस्तित्व पा ही नहीं सकती। विशेषकर उपन्यास तो कदापि नहीं क्योंकि आज उपन्यास ही जीवन-यथार्थ को सर्वाधिक उजागर करने वाली साहित्यिक विधा है।

छायावाद कालीन हिन्दी उपन्यासकारों में युग-चेतना की न केवल पहचान थी, अपितु उनमें राजनीतिक चेतना की गति की सम्यक् विकास-योजना भी थी। अपने समय के राजनीतिक उथल-पुथल के प्रति वे सचेत थे, सजग थे। पल-पल में राजनीति के क्षेत्र में बदलने वाली स्थितियों, उनका आम जनता पर पड़ने वाले प्रभावों और उनके लिए जनता में व्याप्त आक्रोश—सभी को इन उपन्यासकारों ने सजगता से और सावधानी से उजागर किया है। राजनीतिक चेतना की दृष्टि से इन लेखकों को पूर्ण प्रौढ़ कहा जा सकता है। निराला और प्रेमचन्द जैसे कथाकारों की तो बात ही क्या—रूमानी चेतना से सम्पन्न इलाचंद जोशी, जयशंकर प्रसाद, भगवतीचरण वर्मा, भगवतीप्रसाद वाजपेयी, चतुरसेन शास्त्री, उषादेवी मित्रा आदि सभी के सभी कथा लेखकों ने भी तद्‌युगीन राजनीतिक चेतना के अंकन में पर्याप्त सजगता, सचेतनता और ईमानदारी का परिचय दिया है।

साहित्य मानवीय सामाजिक संबंधों से रक्त प्राप्त कर अपने को जीवित ही नहीं रखता, उत्तरोत्तर अपनी शक्ति का विकास भी करता है। समाज ही साहित्य-सृजन के मूल में होता है। साहित्यकार स्वयं सामाजिक प्राणी होता है। वह रचता है समाज के लिए और रचना में भी सामाजिक परिवेशों को ही पुनर्सृजित करता है। फिर, सृजन का माध्यम भाषा भी सामाजिक ही होती है। कहने का आशय यह कि रचना का अस्तित्व ही समाज के लिए होता है। उपन्यास के संदर्भ में यह बात और भी जोर देकर कही जा सकती है।

छायावाद कालीन हिन्दी उपन्यासों में व्यष्टि और समष्टि दोनों ही प्रकार की सामाजिक चेतनाएं प्रभूत मात्रा में वर्णित हुई हैं। यही इन उपन्यासों की विभेदक विशेषता भी है।

छायावाद कालीन हिन्दी उपन्यासों के लेखक तद्‌युगीन सामाजिक, राजनीतिक और आर्थिक तीनों ही परिस्थितियों के बदलाव के प्रति जागरूक थे। वे खुली आंखों से युग के हर परिवर्तन को देखते थे। उनकी गहराई में जाकर उनके कारणों को तलाशते थे और तब अन्ततः किसी निष्कर्ष पर पहुँचते थे। उनके उपन्यासों में ये सारी ही प्रक्रियाएँ उजागर हुई हैं। इन अर्थों में ये कथाकार निश्चय ही युग चारण रहे हैं। यही कारण रहा कि इन उपन्यासकारों के उपन्यासों की संभावना अजस्र रही है और युग निर्माण में इनकी भूमिका महत्त्वपूर्ण रही है।

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

योगिराज अरविन्द चाहते थे कि जिस प्रकार संपूर्ण विश्व बदल रहा है उसी तरह भारत को भी बदलना चाहिये, लेकिन भौतिक दृष्टि से हीन भारत में उनका वह सपना पूरा नहीं हुआ। विज्ञान तो आया पर वैज्ञानिक दृष्टि विकसित नहीं हुई। फलतः मनुष्य और उसका जीवन अन्तर्विरोधों से और भर गया। हिन्दी के तद्युगीन उपन्यासकारों ने इन अन्तर्विरोधी को चित्रित कर अपनी युग-चेतना को भरपूर उजागर किया है।

तृतीय अध्याय : सांस्कृतिक चेतना

संस्कृति जीवन की बेहतरी में वास करती है। जीवन की बेहतरी अर्थ पर निर्भर है। आर्थिक शोषण आम जन के जीवन को कभी बेहतर नहीं बनने देता। फिर, सांस्कृतिक क्रांति की बात सर्वथा अनर्गल और निरर्थक है। अर्थ की संपन्नता अनायास जीवन-विधि में बदलाव लाती है। इसी तरह आर्थिक विपन्नता भी जिंदगी की बेहतरी को गढ्ढे में धकेल देती है। आशय यह कि सांस्कृतिक चेतना बहुत कुछ आर्थिक चेतना से प्रत्यक्षतः जुड़ा हुआ प्रश्न है। यही कारण है कि युग-चेतना छायावाद कालीन हिन्दी उपन्यासकारों ने आर्थिक शोषण और उससे मुक्ति के प्रश्न के हल को सांस्कृतिक स्तर पर खोजा है। इस दृष्टि से भी ये रचनाकार युग चारण कहे जा सकते हैं।

छायावाद कालीन उपन्यासकार सांस्कृतिक चेतना की दृष्टि से प्रौढ़ रचनाकार रहे हैं। समाज और राजनीति की तरह संस्कृति के क्षेत्र में वैज्ञानिकता को प्रश्रय दिया है, अंधविश्वास और जड़ता को ध्वस्त किया है तथा सांस्कृतिक बदलाव के लिए भूमिका रची है। सामाजिक और राजनीतिक क्रांति के साथ ही सांस्कृतिक क्रांति भी इनका लक्ष्य है।

चतुर्थ अध्याय : मनोवैज्ञानिक चेतना

१९२० से लेकर १९४० तक का कालखंड जहां सामाजिक और राजनीतिक चेतना से बहुत अधिक सजग हो गया था वहीं 'व्यक्ति-चेतना' और 'अस्तित्व-चेतना' की नींव भी पड़ गई थी। मनोवैज्ञानिक सजगता और सचेतनता काफी बढ़ गई थी। तद्युगीन हिन्दी उपन्यासों में इसीलिए मनोवैज्ञानिक चेतना की भी भरपूर विद्यमानता है। यह भी युग-चेतना का ही अंग रही है। गोदान (प्रेमचन्द) ने जहां सामाजिक यथार्थवादी चेतना की अपार संभावनाओं का द्वार खोला वहीं त्यागपत्र और सुनीता (जैनेन्द्र) ने मनोवैज्ञानिक चेतना के लिए भी मार्ग प्रशस्त किया। समाज और व्यक्ति के बहिर्जगत के निरूपण में जहां प्रेमचंदीय परम्परा ने अपनी विरासत छोड़ी वहीं समाज और व्यक्ति के अन्तर्जगत की परतों को खोलने के लिए जैनेन्द्रीय परम्परा ने रास्ते दिखाये।

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

हिन्दी कथा साहित्य में मनोवैज्ञानिक चेतना भी उसी कालखंड में विकास पाने लगी थी। ठीक सामाजिक और राजनीतिक चेतना के समानांतर ही।

पंचम अध्याय : वैचारिक संवेदना

मध्यकाल तक यह धारणा थी कि साहित्य का संबंध मूलतः अनुभूति से है। विचार मस्तिष्क की चीज है और अनुभूति लक्ष्य की। फलतः साहित्य सृजन में विचार लगभग विरोधी स्थिति उत्पन्न करता है। उस रूप में बात भी ठीक है। रोमानी चिंता-धारा आज भी ऐसा ही मानकर चलती है। उनकी सोच में साहित्य या तो 'अनियंत्रित उज्ज्वल आवेग का वाणी-विधान है' या नहीं तो 'उत्तम शब्दों का उत्तम क्रम।' यह धारा साहित्य रचना को अचेतन प्रयास मानकर चलती है। उद्देश्य के रूप में आनंद, रस या फिर परमानंद की बात करती है। इस दृष्टि से देखने पर तो विचार साहित्य-सृजन का सहयोगी कभी भी प्रमाणित नहीं हो सकता। ठीक इसके विपरीत एक दूसरी चिंता-धारा है जो साहित्य रचना को सचेतन प्रयास घोषित करती है। वह मानती हैं कि रचना का कोई न कोई उद्देश्य होता है। वह मानवीय प्रयास है। अतः अनुभूति के साथ साथ उसमें विचार का होना आवश्यक है। फिर अनुभूति और विचार में कोई विभाजक रेखा भी तो नहीं खींची जा सकती। आज का युग पूर्णतः विज्ञान का युग है। विज्ञान और तकनीकी प्रगति ने इस सृष्टि को देखने-परखने का एक नया नजरिया दिया है। मानव जीवन और उसकी जीने की प्रणाली उतनी अधिक जटिल है कि उस जटिलता की समग्रता की पहचान कठिन हो गयी है। साहित्य को अपने इसी वैज्ञानिक युग की समस्त चेतना का संवहन करना होता है—संवहन करना ही क्यों उसे विकसित करने की भूमिका भी निभानी होती है। फिर, विचार को साहित्य से खारिज कैसे किया जा सकता है? अतएव, आज यह मानना कि साहित्य विचार रहित होकर जी सकता है, निरर्थक और अनर्गल है।

अब प्रश्न उठता है कि क्या विचार उसी रूप में साहित्य में उतरता है, जिस रूप में ज्ञान के अन्य अनुशासनों में? उत्तर में स्पष्टतः नहीं कहना होगा क्योंकि ज्ञान के प्रत्येक अनुशासन का स्वभाव एक दूसरे से भिन्न होता है। साहित्य सर्जन है आकलन नहीं। फलतः विचार संवेद्य होकर भी साहित्य का उपजीव्य बनता है। वह पानी पर तैरता हुआ लकड़ी का टुकड़ा नहीं होता, अपितु पानी के साथ बहने वाली ऊर्जा के रूप में होता है जो उस पानी के साथ घुलामिला होता है। हिन्दी उपन्यासों में मार्क्स और फ्रायड के विचारों को जिस रूप में उतारा गया है, वह अपने आप में एक प्रमाण है जो अब लगभग स्वयंसिद्ध सा हो रहा है। प्रेमचंद, यशपाल, रांगेय राघव, राहुल तथा नागार्जुन आदि ने समाजवादी चिंतन और जैनेन्द्र, इलाचंद जोशी और

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

अज्ञेय ने मनोवैज्ञानिक चिंतन को जिस प्रकार संवेदन ढ़ालकर अपने उपन्यासों में उतारा है, वही साहित्य और विचार के सहयोगी और सहभागी प्रयास को उजागर करने के लिए पर्याप्त है। फिर, युग की एक वैचारिक चेतना भी तो होती है। जिसके निर्माण में जहां अपनी मिट्टी की मांग होती है वहीं बाहरी वैचारिकता का प्रभाव भी। युग-चेतना-रचनाकार इसी मांग और प्रभाव को लेकर अपनी रचनाओं में नूतन प्रयोग करता है। फिर हिन्दी उपन्यास रचना में यह प्रयोग भी उदाहरणीय है। प्रेमचन्द, प्रसाद, निराला, जैनेन्द्र, इलाचंद जोशी आदि के उपन्यासों में छायायुग की यह चेतना भी भरपूर विकसित हुई है। कथा रचना में वैचारिकता की नींव यहीं ठोस कर दी गई है।

षष्ठ अध्याय : कला संचेतना

वस्तु संचेतना की तरह प्रत्येक युग की कला-संचेतना भी विशिष्ट होती है। युग-चेतना विषय वस्तु को तो प्रभावित करती ही है साथ ही उसका रूप भी बदल देती है। जिस तेजी से युग-चेतना कला की विषय-वस्तु को बदलती है उसी तेजी से वह उसके रूप को भी बदल देती है।

कला के 'वस्तु' और 'रूप' दोनों में बदलाव की महत्त्वपूर्ण भूमिका युग-चेतना रचती है। यों परिवर्तन के और भी अन्य कई कारण हैं जिनमें कलाकार का संस्कार, रचना का उद्देश्य आदि भी प्रमुख हैं। लेकिन रचनाकार के मानस और उसके संस्कार को भी युग-चेतना ही रचती है। रचना का उद्देश्य भी एक अर्थ में युग-चेतना की मांग हुआ करती है। रचनाकार अपनी रचना से जहां युग को वाणी देकर युग को ही पुनः सम्प्रेषित करता है वहीं दूसरी ओर वह नये प्रगतिशील युग की रचना भी करता है। इन दोनों ही अर्थों में उसे युगद्दष्टा और युगसृष्टा दोनों की समवेत भूमिका निभानी होती है।

किसी भी कला के निर्माण में जितनी ही अधिक शीघ्रता से उसके वस्तु रूप में परिवर्तन आता है, उतनी ही शीघ्रता से उसके कला रूप या शिल्प रूप में भी परिवर्तन आता है। युग-चेतना के अनुरूप उस कला विशेष की संरचना, बनावट, बुनावट सभी में अंतर आ जाता है। यह दूसरी बात है कि रूप परिवर्तन की यह प्रक्रिया बहुत कुछ आतंरिक होती है। फलतः इस प्रक्रिया को बाहर के धरातल पर नहीं देखा जा सकता। होता यह है कि युग-चेतना के अनुरूप नये यथार्थ की ऊर्जा से जब रचना की वस्तु ऊर्जस्वित होती है तो उसके रूप का स्वतः विस्फोट होता है। वाल्मीकि रामायण, मानस (तुलसी), मेघनाद वध (मधुसूदन दत्त) और साकेत (मैथिलीशरण गुप्त)—इन चारों ही महान् रचनाओं की कथावस्तु एक ही है किन्तु चारों में जिस प्रकार अपने अपने युग के अनुकूल इस युग की चेतना विशेष ने उसके वस्तु जगत को बदल दिया है, उसी

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

तरह इनके रूप जगत में भी एक क्रांतिकारी परिवर्तन ला दिया है। कहने का आशय यह कि प्रत्येक युग अपनी चेतना के अनुरूप कला-वस्तु के साथ साथ कला-रूप को भी बदल दिया करता है। इसी अर्थ में हर युग की कला एक दूसरे से व्यावर्त करती है।

छायायुग में कथानक सृष्टि की दिशा में हिन्दी उपन्यास को एक साहसिक दृष्टि मिली। विवरणात्मकता का क्षेत्र शिथिल और दुर्बल हुआ। विश्लेषण प्रणाली ने विकास पाया। कथा रचना में गठन तत्त्व उपेक्षित तो हुआ उसका आकार भी सिकुड़ने लगा। गोदान पर तो यह आरोप ही है कि उनकी दोनों कथाएँ कहीं जुड़ती नहीं हैं। उन्हें जुड़ना था भी नहीं। विशृंखलता ही उस उपन्यास की कथासृष्टि की एक व्यावर्त विशेषता है। जैनेन्द्र तक आते-आते तो कथा तत्त्व लगभग गौण-सा हो गया। उनके पाठकों को कथा तत्त्व पकड़ने के लिए छलांग लगाने की जरूरत पड़ने लगी। या यों कहें कि कथा तत्त्व की जगह मनुष्य का चरित्र तत्त्व प्रधान हो उठा, वातावरण ने सजीवता ग्रहण की। अतः छायावाद युगीन इन उपन्यासों में युग-चेतना ने कथा-सर्जन क्षेत्र में संभावना का अजस्र स्रोत उजागर किया।

चौथे दशक की समाप्ति तक आते आते हिन्दी उपन्यासों में चरित्र-चित्रण प्रणाली में भी अभूतपूर्व परिवर्तन हुआ। जैसे हिन्दी उपन्यासों में कथात्मकता आदर्श से यथार्थ के धरातल पर उतरी चरित्र-चित्रण विधि भी पूर्णतः यथार्थ-वादी बन गई। १९३६ तक भारतीय मानस मार्क्स और फ्रायड के विचारों से आक्रांत हुआ। भ्रम का कुहरा धीरे-धीरे छंटता गया। वास्तविकता के प्रति रुझान प्रबल होने लगा। युग की इस चेतना ने उपन्यास लेखन पर बहु आयामी प्रभाव डाला। फलतः चरित्र चित्रण की प्रणाली भी भूरिशः प्रभावित हुई।

चौथे दशक तक आते-आते यह तथ्य सत्य हो गया था कि मनुष्य मूलतः वातावरण की देन है। उसकी चेतना का निर्माण वातावरण करता है, तद्युगीन परिस्थितियाँ करती हैं, इसलिए मनुष्य और उसके चरित्र को समझने, समझाने के लिए परिस्थितियों का सर्जन आवश्यक-सा हो गया। समाजवादी यथार्थवादी चेतना से संपन्न कथाकारों के उपन्यासों में इसीलिए इन बाह्य परिस्थितियों के सर्जन पर विशेष ध्यान दिया गया है।

मनोविश्लेषण प्रधान उपन्यासों में बाह्य वातावरण को गौण माना गया है। परन्तु उसकी जगह अन्तः के वातावरण को प्रधान स्थान दिया गया है। यों अन्तः का वातावरण भी बाह्य वातावरण की ही मानसिक छवि है। इस तरह बाह्य और अन्तः दोनों ही परिस्थितियों के सर्जन ने उसके उपन्यासों की एक नई पहचान बनाई है। कथा और चरित्र सृष्टि में भी ये उपन्यासकार युग-चेतना से प्रभूत प्रभावित रहे हैं।

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

वस्तुतः छायावाद का कालखंड भाषा संस्कार की दृष्टि से सर्वाधिक सजग और चेतन रहा है। भारतेन्दु युग की प्रयोगशील भाषा द्विवेदी युग में व्यवस्थित स्वरूप तो पा गई परन्तु सम्प्रेषण की क्षमता से ओत-प्रोत हुई छायायुग में ही। माध्यम की सही क्षमता इसी कालखंड में आकर विकसित हुई। इस विकास को गति देने में छायावादी युग के उपन्यासकारों की भूमिका बहुत अधिक महत्त्वपूर्ण रही है। युग ने अभिव्यक्ति की जिस आवश्यकता को महसूसा था, इन कथाकारों ने भी अपने उपन्यासों में उसी संपदा से भाषा को संपन्न बनाया। आशय यह कि इन उपन्यासों की भाषा सृष्टि भी पूर्णतः युग-चेतना के अनुरूप ही रही है।

कला चेतना की दृष्टि से इस कालखण्ड के उपन्यास कई अर्थों में क्रांतिकारी प्रमाणित हुए। प्रेमचंद से जैनेन्द्र और इलाचंद जोशी तक आते-आते कथानक की विशृंखलता से चलकर कथानक की लघुता, फिर उसका लोप और अंततः कथाहीनता के शिल्प का द्वार इसी कालखंड ने खोला।

चरित्र सृष्टि की दृष्टि से तो यह कालखंड और भी युगांतरकारी साबित हुआ। संपूर्ण मनुष्य अपनी आंतरिकता और बहिर्मुखता के साथ समस्त जटिलताओं में प्रत्यक्षीकृत होने लगा। इसी धरती का मनुष्य अपनी समस्त विशेषताएं, अच्छाइयों और बुराइयों के समवेत रूप में सामने आया। इन मनुष्यों को निर्मित करने वाले वातावरण या तद्युगीन निर्मात्री परिस्थितियाँ भी विश्लेषित हुई और अंततः यथार्थ की भित्ति पर खड़े उस युग के मनुष्य को उसकी संपूर्ण जीवनगत जटिलताओं को वाणी दी उस युग की भाषा ने। इन उपन्यासों के कथानक को इन्हीं चारित्रिक जटिलताओं और इनके घटित होने वाले बहुरंगी क्षेत्रों को भाषा ने फिर से रचकर एक सुन्दर संसार दिया है, जो सद्यः युग-चेतना प्रसूत है। इसी अर्थ में छायावादी कथाकार युग चारण तो हैं ही, युग रचयिता भी हैं।

निष्कर्ष यह कि छायावाद युग के कथाकारों ने अपने कथा साहित्य में अपने युग को समग्रता से वाणी दी है। उस युग की चेतना की संभावनाओं को भरपूर उजागर किया है। ये कथाकार युग चारण ही नहीं गुण सर्जक भी रहे हैं। इनके उपन्यासों में उस युग की सामाजिक, राजनीतिक, सांस्कृतिक, वैचारिक, मनोवैज्ञानिक और कथात्मक—समस्त संचेतनाएं विकसित हुई हैं।

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

भक्त कवि ईसरदास : व्यक्तित्व और कृतित्व

(कुमारी) वीणा पुरोहित

वर्ष १९८५ में पी-एच० डी० (हिन्दी) की उपाधि के लिए
जोधपुर विश्वविद्यालय द्वारा स्वीकृत शोध-प्रबंध का सारांश*

राजस्थान प्रदेश के साहित्यकार ने एक हाथ में कलम और दूसरे हाथ में करवाल थाम कर अपने वीरत्व तथा कवित्व का अद्भुत परिचय दिया है। यहां के वीरों एवं वीरांगनाओं ने अपनी रक्त वृष्टि से यहां बाढ़ की स्थिति उत्पन्न कर दी है। युद्ध का नशा यहां के वीरों को सदा रहता है। फलतः यहां वीरतापरक साहित्य प्रभूत मात्रा में सृजित हुआ है। यहां के साहित्य के वैशिट्य के सम्बन्ध में डा० सुनीति कुमार चाटुर्ज्या के विचार अवलोकनीय है—"राजस्थानी लिट्रेचर इज़नथिंग बट ए मैसेजऑफ ब्लड फलडेड लाइफ़ एण्ड स्टार्मी डेथ"। यही सही एवं सर्वमान्य है कि राजस्थानी का वीरतापरक साहित्य विश्व-वाङ्मय में अद्वितीय है, पर इससे यह अर्थ निकालना सर्वथा भ्रामक है कि राजस्थानी में वीरता के अतिरिक्त अन्य किसी प्रकार का साहित्य उपलब्ध ही नहीं है। राजस्थानी में मानव-मन के समस्त भावों से सम्बन्धित साहित्य भी प्रभूत मात्रा में मिलता है। इस प्रदेश में सृजित भक्ति साहित्य भी बेजोड़ एवं अनूठा है। राजस्थान में ऐसे-ऐसे उत्कृष्ट कोटि के एवं चमत्कारी भक्त हुए हैं जो अपने समय एवं कालान्तर में ईश्वर के अवतार ही मान लिये गये हैं। इन भक्तों में हमारे विवेच्य कवि ईसरदास का नाम सर्वप्रथम लिया जाता है। इन्हें जन-सामान्य ने 'ईसरा परमेसरा' के सम्बोधन से पुकार कर ईश्वर स्वरूप ही मान लिया है।

इस अध्याय में मैंने भक्ति शब्द को परिभाषित करते हुए एवं भक्ति की महत्ता को प्रतिपादित करते हुए भक्ति की भारतीय परम्परा का संक्षिप्त परिचय प्रस्तुत किया है। इसके पश्चात् राजस्थान प्रदेश में प्रचलित विविध संत एवं भक्ति सम्प्रदायों (दादू पंथ, रामस्नेही सम्प्रदाय, दरिया पंथ, विश्नोई सम्प्रदाय, नाथ योगी सम्प्रदाय, अलखिया सम्प्रदाय, जसनाथी सम्प्रदाय, आई पंथ, चरण-

*यह शोध डॉ० सोहनदान चारण, सहायक प्रोफेसर, हिन्दी विभाग, जोधपुर विश्वविद्यालय, जोधपुर के निर्देशन में किया गया।

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

दासी सम्प्रदाय, निरंजनी सम्प्रदाय, लालदासी पंथ, गूदड़ पंथ) का संक्षिप्त परिचय प्रस्तुत कर उनकी विशिष्ट मान्यताओं पर प्रकाश डाला है। तत्कालीन समाज इन संतों एवं भक्तों की देन से पूर्णरूपेण लाभान्वित हुआ है, वर्तमान में हो रहा है और भविष्य में भी होता रहेगा। मध्यकालीन राजस्थान में हिन्दू समाज को व्यवस्थित बनाये रखने, धर्म परिवर्तन को रोकने, पथ-विचलित एवं किंकर्त्तव्यविमूढ़ावस्था में पहुंचे लोगों को कर्त्तव्य-पथ की ओर अग्रसर करने, लोक-व्यवहार की नीति का पाठ-पढ़ाने तथा जन-सामान्य को भक्ति रसामृत के पावन सरोवर में स्नान कराने का महत्कृत्य इन संत एवं भक्त कवियों ने किया। वह युग आस्थाओं के विखंडित होने का युग था। कर्मकाण्ड और धर्म के बाह्याचारों से सर्वसाधारण दिग्भ्रमित हो रहा था। धार्मिक सहिष्णुता एवं सत्यप्रेरित आचार-संहिता लुप्त-प्राय थी। विविध-संकीर्णताओं के कारण श्रेष्ठ आध्यात्मिकता के कहीं दर्शन नहीं हो रहे थे तथा विविध मत-मतान्तरों की मरू-मरीचिका में राजस्थानी व्यक्ति भटक रहा था। मति-विभ्रम के इन नाजुक क्षणों में इन्हीं संतों और भक्तों ने राजस्थानी-वासियों को सरल प्रेमाभक्ति का लोक-भाषा में रचित अपने काव्य द्वारा पाठ पढ़ा कर उपकृत किया। इन भक्त कवियों में ईसरदास का नाम विशेष रूप से उल्लेखनीय है, क्योंकि मरूवासी जहां एक ओर इनकी पीयूष-वर्षिणी काव्य-सरिता में नहाकर कृत-कृत्य हुए वहीं दूसरी ओर कई लोग तथा प्राणी इनके अद्भुत चमत्कारों से लाभान्वित हुए।

द्वितीय अध्याय में तत्कालीन राजस्थान के छोटे-छोटे राज्यों की विशृङ्खलित राजनैतिक, कुरीतियों से ग्रस्त एवं द्वेषपूर्ण वातावरण प्रधान सामाजिक, धर्मान्धता एवं पाप-पुण्य के आधार पर स्वर्ग-नरक विश्लेषक धार्मिक तथा संकुचित राष्ट्रीयता एवं आवेशयम वीरता के आधार पर प्रशस्ति-परक साहित्यिक परिस्थितियों पर विचार किया गया है। इसी अध्याय में आलोच्य कवि ईसरदासजी की जीवनी, उनकी वंश परम्परा एवं उनके अलौकिक चमत्कारों का विवेचन किया गया है। ईसरदासजी के जन्म संवत् को लेकर विद्वानों में मतवैभिन्य है। इस मतवैभिन्य का प्रमुख आधार रहे हैं अलग-अलग पाठ वाले लोक प्रचलित दोहे। ये दोहे इस प्रकार हैं :

पनरासौ पनरोतरै, जलम्या ईसरदास।
चारण वरण चकार में, उण दिन हुवौ उजास ।।१।।

पनरासौ पिच्याणवै, जनम्या ईसरदास।
चारण वरण चकार में, उण दिन हुवौ उजास ।।२।।

संवत् पनर पंचावने, जनम्या ईसर चन्द।
चारण वरण चकार में, उण दिन हुवौ आनंद ।।३।।

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

सर भुव सर ससि, बीज भ्रगु श्रावण सित पखवार ।
समय प्रात सूरा घरे, ईसर जी अवतार ।।४।।

पनरा पर पनरै पुणां, जनम्यौ ईसर जांण ।
सुकर बीज श्रावण सुदी, मल आयौ कुल भांण ।।५।।

उपर्युक्त दोहों में भक्त कवि ईसरदास का जन्म संवत् १५१५, १५५५ एवं १५९५ में हुआ बताया गया है। इन लोक प्रचलित दोहों के आधार पर ईसरदासजी के वर्तमान वंशज संचाणा ग्राम निवासी श्री जबरदानजी रोहड़िया से सामग्री प्राप्त करके तथा जातीय वहीवंचा रावळ भीमजी भारमल की बही में उद्घृत उद्धरणों के आधार पर एवं गणना की कसौटी पर सही उतरने पर मैं इस निष्कर्ष पर पहुंची हूँ कि ईसरदासजी का जन्म संवत् १५१५ ही सही है। मुझे वहीवंचा रावळ भीमदेव भारमल की ऐतिहासिक बही से ईसरदासजी के जन्म एवं इहलौकिक लीला संवरण करने के सम्बन्ध में निम्न दो दोहे प्राप्त हुए हैं, जिनकी पुष्टि ईसरदासजी के वर्तमान वंशज श्री जबरदानजी रोहड़िया (संचाणा–गुजरात) द्वारा भी कर दी गई है, अतः प्रामाणिकता के लिए इससे बढ़कर और कोई आधार नहीं हो सकता है। इन दोनों दोहों को यहां प्रस्तुत किया जा रहा है :

संवत् पनरे पनर में, जनमेश्रा ईसरदास ।
चारण वरण चकार में, उण दिन होयो उजास ।।१।।

संवत सोळ बावीस में, चउत्र मास पूनम दन गुरूवार
ईसाणंद कव ओधरे, वसव कीश्रो जसवास ।।२।।[1]

इस अध्याय में मैंने यह भी स्पष्ट कर दिया है कि चारण जाति में ईसरदास नामक के एकाधिक कवि हुए हैं। परिणामस्वरूप जिज्ञासु पाठक भ्रमवशात् एक के पाठ को दूसरे का पाठ मान बैठता है। मुझे भी जोधपुर के 'प्राच्य विद्या प्रतिष्ठान' से ईसरदास प्रणीत 'अजीत विलास' शीर्षक हस्तलिखित कृति मिली पर काव्य एवं भाषा शैली तथा शब्द-प्रयोगों की दृष्टि से यह रचना हमारे आलोच्य भक्त कवि की प्रतीत नहीं हुई। इसके अतिरिक्त ईसरदासजी ने 'हालां झालां रा कुंडळिया' एवं कुछेक फुटकर गीतों के अतिरिक्त व्यक्ति परक रचनाएं नहीं कीं। आपका समूचा काव्य ईश्वरीय भक्ति से ओत-प्रोत है। इन सब आधारों पर मैंने इसे ईसरदास के साहित्य में स्थान नहीं दिया।

भक्त कवि ईसरदासजी से सम्बन्धित मुझे जितनी भी किंवदन्तियां मिलीं, उन्हें भी इसी अध्याय में स्थान दिया गया है। ये किंवदन्तियां ईसरदासजी के समग्र व्यक्तित्व की व्यंजक हैं, अतः मैंने सभी किंवदन्तियां यथा श्रुत प्रस्तुत कर दी हैं। साथ ही इन किंवदन्तियों से सम्बन्वित उपलभ्य पद्य भी प्रस्तुत कर दिये हैं। वस्तुतः इन प्रामाणिक पद्यों ने ही इन किंवदन्तियों को जीवित रखा है।

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

ग्रतः इन पद्यों को यथावत् प्रस्तुत करना ग्रावश्यक हो गया। यहां यह भी ज्ञातव्य है कि विद्वानों में ईसरदासजी के पिता के नाम को लेकर भी पर्याप्त विवाद रहा है। कुछ विद्वान उनके पिता श्री का नाम 'सूजा' बताते हैं तो कुछ ग्रन्य 'सूरा' बताते हैं। मुझे लगा कि केवल तीन-चार विद्वान ही ग्रपनी हठ-धर्मिता के कारण ही उनके पिता का नाम 'सूजा' बताते हैं। मैं दावे के साथ कह सकती हूँ कि ईसरदासजी के पिता का नाम 'सूरा' था। प्रथमतः तो तर्क यह है कि ग्रधिकांश विद्वान इनके पिता का नाम 'सूरा' ही बताते हैं। इसके ग्रतिरिक्त ईसरदासजी की प्रशस्ति में लिखे जितने भी पद्य मिले हैं, उन सब में उन्हें 'सूर उत', 'सूरा उत' सम्बोधन से ही सम्बोधित किया गया है। कहीं भी 'सूजाउत' नहीं कहा गया है। इसके ग्रतिरिक्त वहीवंचा रावळ की वही में भी उन्हें सूराजी का पुत्र बताया गया है। इस प्रसंग में मैं वह एक दोहा प्रस्तुत करना चाहती हूँ जो ईसरदासजी के ग्रवतार के सम्बन्ध में एवं ज्वालागिरि महंत द्वारा सूरा को दिये गये पुत्र प्राप्ति के वरदान से सम्बन्धित है :

> कापड़ियो हिंगळाज रौ, हेमाळे गळियौह।
> बारहठ सूरा रे घरै, ईसर ग्रवतरियौह॥

इनकी जीवनी प्रस्तुत करने के साथ इनकी शिष्य परम्परा एवं व्यक्तित्व के विशिष्ट बिन्दुग्रों (उदार हृदय, स्वाभिमानी, भावुकता, परोपकार, श्रद्धालुता ईश्वर में ग्रडिग विश्वास) पर भी पर्याप्त चर्चा की गई है।

तृतीय ग्रध्याय में भक्तराज ईसरदास प्रणीत विशिष्ट भक्ति काव्यो (हरिरस, देवियांण एवं गुण वैराट्) का विशद् विवेचन किया गया है। 'हरिरस' एवं 'देवियांण' भक्ति भावना की ग्रभिव्यक्ति की दृष्टि से श्रेष्ठ ग्रन्थ हैं। हरिरस की महत्ता इसी तथ्य से ग्रांकी जा सकती है कि राजस्थान एवं गुजरात में मरणासन्न प्राणी को 'हरिरस' इसलिए सुनाया जाता है ताकि उसकी मुक्ति हो। इसके साथ ही इस ग्रन्थ की दूसरी उल्लेखनीय विशेषता यह है कि इसमें कवि किसी वाद-विशेष की वकालत करता दिखाई नहीं देता। यद्यपि ईसरदास के समय तक ग्रध्यात्म के क्षेत्र में विविध वाद एवं मत-मतान्तर प्रचलित हो गये थे ग्रौर इसके जटिल जाल से निकल पाना जनसाधारण के लिए ग्रसम्भव-सा था। लोगों के समक्ष यह भी समस्या थी कि वे किस बात या सिद्धान्त को स्वीकारे ग्रौर किसे नकारे। ऐसी विकटतम परिस्थिति में ईसरदासजी ने सर्व-सामान्य को सगुण-निर्गुण का समन्वित स्वरूप दिखाकर उस दिव्य शक्ति की भक्ति में लीन रहने का पाठ पढ़ाया। ग्राप सगुण-निर्गुण में से न किसी की निंदा करते हैं ग्रौर न किसी की तरफदारी, ग्रपितु दोनों स्वरूपों में ऐक्य स्थापित करना ही ग्रापको ग्रभिप्रेत था। इसी प्रकार 'देवियांण' में भी ग्रापने उस परम प्रकृति स्वरूपा देवी के विराट् स्वरूप की विविध झांकियां चित्रित की हैं। पुरुष ग्रौर प्रकृति के

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

समस्त स्वरूपों में, उनके समग्र कृत्यों में और सचराचर सभी में वही एक शक्ति-तत्त्व विद्यमान है। त्रास और त्राण देना—दोनों ही कार्य इसके हैं। एक जीव के रूप में दूसरे जीव को मारने और मरने वाला दोनों ही जगह यही तत्त्व है। क्रिया-प्रतिक्रिया एवं उनका परिणाम—सब कुछ यही है। और तो और अनुकरणीय एवं चौंकाने वाली सभी तरह की मान्यताएं स्थापित एवं विस्थापित करना भी इसी प्रकृति तत्त्व का ही कार्य है। जैसा कि शीर्षक से ही स्पष्ट है 'गुण वैराट्' में कवि ने प्रभु के विराट स्वरूप के दर्शन कराये हैं। कहा जा सकता है कि 'देवियांण' और 'गुण वैराट्' एक-सी ही लेखन शैली में रचित प्रकृति एवं पुरुष के विराट् स्वरूप को निरूपित करने वाले काव्य-ग्रन्थ हैं। यहीं मैंने यह भी सिद्ध किया है कि उस युग में अवतार चरित्रों के साथ-साथ विविध लोक देवी-देवताओं की मान्यताएं भी प्रचलित थीं तथा इनके उपासक परस्पर बड़ी ईर्ष्या रखते थे। एक के आराध्य की हेठी दिखाना एवं अपने आराध्य को सर्वश्रेष्ठ सिद्ध कर जन-साधारण को भ्रमित करना ही इनका मात्र उद्देश्य था। ऐसे समय में ईसरदासजी ने सभी देवी-देवताओं का स्तवन कर एवं सभी को आदरणीय बताते हुए परम तत्त्व में मन लगाने की बात कह कर समाज का बहुत बड़ा उपकार किया है। इनके किसी काव्य में संकीर्णता की बू नहीं आती। यहां तक कि आपने तो राम और रहीम को एक ही बताया है तथा हिन्दू-मुस्लिम दोनों धर्मों में साम्प्रदायिक सद्भाव पैदा करने का महत्प्रयास किया है। मैंने यहां यह भी सोदाहरण सिद्ध किया है कि ईसरदासजी ने जैन धर्म के प्रति भी श्रद्धा भाव रखते हुए उनके तीर्थङ्करों में भी उसी परम-ज्योति के स्वरूप को दिखाया है। इस प्रकार सभी धर्मों की श्रेष्ठ मान्यताओं को प्रकट करते हुए आपने सभी रूपों में एक ही परम तत्त्व का आलोक दिखाया है। केवल दर्शन और अध्यात्म के क्षेत्र में ही ईसरदासजी का योगदान रहा हो, ऐसी बात नहीं हैं। आपने कवि के रूप में अपने सामाजिक उत्तरदायित्व का भी पूर्णतः निर्वाह किया है। तत्कालीन समाज में फैले कर्मकाण्ड एवं बाह्याचारों को असार बताकर लोगों को सदाचार तथा प्रभु-नाम-स्मरण हेतु प्रेरित किया है। ऐसा करते समय भी आपका स्वर कबीर की तरह उग्र एवं खण्डनात्मक न होकर शांत और अच्छी तरह समझा बुझाकर उचित सलाह देने वाले व्यक्ति के स्वर जैसा रहा है, जो तुलनात्मक दृष्टि से अच्छे-बुरे को प्रतिपादित कर श्रेयस् को अपनाने की बात कहता है। यहां एक उदाहरण प्रस्तुत है जो ईसरदास प्रतिपादित नाम माहात्म्य के सम्बन्ध में है:

> गौ कोटि दानं ग्रहणे च कासी, मकरे प्रयोग (अ) युत कल्पवासी।
> यज्ञेच मेरू सम हेम दानं, नहीं तुल्य गोविंद नाम समानं ॥[1]

भक्ति रस को स्वीकृति दिलाने हेतु तो कई विद्वान प्रयत्नशील रहे हैं पर ईसरदासजी तो उससे भी आगे बढ़ कर केवल 'रामरस' में लीन रहने का ही

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

संदेश देते हैं। ईसरदास इस पर-ब्रह्म को कहीं अगम अगोचर बताते हैं तो कहीं उसी पर-ब्रह्म के सगुण साकार का राम-कृष्ण के रूप में निरूपण करते हैं। कुछ उदाहरण देखिए :

कथा केम ईसर कहै, खांण सकळ प्रत खेत।
वाणी स्रवण मन विसय सों, नित्य अगोचर नेत ।।[3]

धरे नर देह अयोध्या धाम, राजा दसरथ तणौ घर राम ।[4]

नमो पुरसोत्तम त्रीकम प्रम्म, नचावण गोपिय नाच अगम्म।
नमो अविगत्त भगत्त अछेह, नमो सत्तरूहण भर्त्त सनेह ।।[5]

आपने प्रभु के सगुण साकार रूप धारण करने के कारण को स्पष्ट करते हुए लिखा है कि भक्तों की पीड़ाओं एवं बाधाओं को दूर करने एवं धर्म की स्थापना हेतु प्रभु अवतरित होते हैं :

भगतांभूप भांजण भीड़ां ।[6]

× × ×

सथापण ध्रम्म प्रकासण प्रव्व ।।[7]

ईसरदासजी प्रमुख रूप से ईश्वर के गुणों का गान करते हुए भी समाज से अपनी दृष्टि नहीं हटाते। वे मनुष्य को सदा मानवीय गुण अपनाने की नेक सलाह देते हैं। उनकी दृष्टि में जो कर्मशील नहीं है, जो ज्ञानी नहीं हैं, जो कुटिल है, उससे प्रभु भी संतुष्ट नहीं होते। अतः आप स्पष्ट कहते हैं :

आळसवां अज्जाणवां, दिस खूटल सूं दूर ।[8]

क्योंकि ईश्वर को सच्चाई प्रिय है :

सच्च पियारा सांईयां, सांई सच्च सहाय ।।[9]

भक्तकवि ईसरदास रामरस के पावन सरोवर को ही उत्कृष्टतम स्थान मानते हैं। यही सर्वोत्कृष्ट तीर्थ है यही श्रेष्ठ तपस्या है। ईसरदासजी के दृष्टि-कोण से इसी रामरस रूपी अमृत सरोवर में खोये व सोये रहना ही प्रत्येक आत्मा का उद्देश्य होना चाहिए। रामरस की यह नूतन धारणा इन पंक्तियों में अवलोक्य है :

रहै विलुबा रामरस, अणरस गिणौ अलप्प।
एह महाध्रम आतमा, अे तीरथ अे तप्प ।।[10]

पर ईसरदासजी की भक्ति में कहीं-कहीं सख्य भाव की भी अभिव्यक्ति हुई है। 'गुण निंदा स्तुति' में तो उन्होंने प्रभु से अनेक स्थानों पर मित्रवत् मीठी चुटकियां भरी हैं पर 'हरिरस' में भी उसी पर-ब्रह्म को ठगों का ठाकुर कहने से नहीं चूके हैं :

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

ठगां राय ठाकर हेकरण थीय, पड़द्दोय नाख परो हयग्रीव ।[11]

और इस ठगों के ठाकुर के साथ मिलकर भक्त की आत्मा जब एकमेक हो जाती है तब उसे कोई शक्ति विलग नहीं कर सकती । यह ईसरदासजी की उत्कृष्ट एवं चरमसीमा की भक्ति भावना की अभिव्यक्ति है, जहां 'एक ते दूसरी आंक' रहता ही नहीं । मित्रवत् चुटकियां भले ही ले लो ईसरदास की भक्ति सेवक सेव्य भाव से प्रेरित भक्ति ही कही जाएगी :

हुवा हवे साहब सेवक हेक,
ओळखिया अन्तर एक अनेक ।
थियो हरि हेक जुवो किम थाय,
मळी गयो पांणिय पांणिय माय ।।[12]

'देवियांण' में ईसरदासजी ने देवी के मातृत्व रूप की विराट् झांकी प्रस्तुत की है । यह रूप निखिल सृष्टि में व्याप्त है । इस ग्रन्थ के माध्यम से प्रकृति स्वरूपा देवी के विराट् स्वरूप की सूक्ष्मातिसूक्ष्म एवं विशालतम रूपों में हुई अभिव्यक्तियों का ज्ञान कराना ही ईसरदासजी का मूल उद्देश्य था । इस मातृत्व शक्ति से ही सभी उत्पन्न होते हैं, उसी से पोषण पाकर सभी विकसित होते हैं और अन्ततः पुनः उसी में लीन हो जाते हैं । सृष्टि के अथ से इति तक देवी ही व्याप्त है । ईसरदासजी कहते हैं :

करता हरता श्री ह्रींकारी, काली कालरयण कौमारी ।
ससि सेखरा सिधेसर नारी जग नीमवण जयो जडधारी ।।[13]

कलेवर की दृष्टि से लघु ग्रन्थ होते हुए भी इस ग्रन्थ के प्रतिपाद्य का विशिष्ट महत्त्व है । सृष्टि के ऐतिहासिक विकास की सूची इसी ग्रन्थ में मिलती है । सर्वत्र प्रकटित रहने पर भी वह परम तत्त्व अज्ञेय ही है । उसकी गति को कोई जान नहीं सकता । अतः ईसरदासजी भी अपनी असमर्थता व्यक्त करते हुए भी देवी से जग-कल्याण हेतु कामना करते हुए लिखते हैं :

देवी तूंज जाणे गति गहन तोरी,
देवी तत्त रूपं गति तूंज मोरी ।
देवी रोग भव हारणी त्राहि माम,
देवी पाहि पाहि देवी पाहि माम ।।[14]

'देवियांण' ग्रन्थ की प्रत्येक पंक्ति 'देवी' शब्द से प्रारम्भ होती है उसी प्रकार 'गुण वैराट' की कुछ पंक्तियों को छोड़कर सभी पंक्तियों के प्रारम्भ में 'नमो' शब्द है । इस ग्रन्थ में आपने यह बताया है कि यह सृष्टि उस लीलाधारी ब्रह्म की लीलास्थली है । प्रतिपाद्य की दृष्टि से इसमें 'हरिरस' एवं 'देवियांण' में

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

विवेचित कई तथ्यों की पुनरावृत्ति हुई है पर सर्वधर्म समभाव एवं सांस्कृतिक समन्वयवादी दृष्टिकोण से इस ग्रन्थ की महत्ता उल्लेखनीय है। इसमें विवेचित विचारधाराएं स्तुत्य तथा ग्राह्य हैं :

नमो खान खाने मिलकां मिलके,
नमो जोध जोधे कररकां किरके।

× × ×

नमो नाथ ग्राडौ कर मुनि जपं।
नमो तीर्थङ्कर करै चोईस तपं।।

हिन्दू, मुस्लिम एवं जैन सभी धर्मों की चर्चा करके सब में समन्वय स्थापित करने का स्तुत्य प्रयास किया है। इस ग्रन्थ में भी कवि ने ब्रह्म की सत्यता एवं अन्य सभी प्रकार की ठगोरी विद्याओं की असारता प्रतिपादित की है। ब्रह्म के सामाजिक दायित्व बोध का परिचय दिया है :

नमो जेण कूड़ा किया मंत्र-जंत्र।

इस अध्याय में अपेक्षित उदाहरण प्रस्तुत कर मैंने ईसरदासजी की सर्व धर्म समभाव प्रधान विचारधारा एवं उनकी भावयित्री प्रतिभा को उद्घाटित किया है।

चतुर्थ अध्याय में ईसरदासजी प्रणीत अन्यान्य उन लघु कलेवरा एवं फुटकर रचनाओं पर विचार किया गया है, जो आज भी हस्तलिखित पोथियों के रूप में वाचनालयों या निजी पुस्तकालयों की कारा में बंद पड़ी हैं तथा वहां योग्य धैर्यशाली एवं गुणी अनुसंधितसुओं की प्रतीक्षा में है। लगभग सैंतीस रचनाओं एवं अनेक फुटकर गीतों-छंदों पर विचार किया गया है। इन लघुकाय रचनाओं एवं फुटकर गीतों-छंदों में विषय-वैविध्य मिलता है जो कवि की बहुज्ञता का परिचायक है। निराकार-साकार एवं राम-कृष्ण की महिमा का गान करने वाले भक्त राज ईसरदास ने गंगा के पावन जल की उपादेयता का बखान किया है। भगीरथ की कष्ट साध्य तपस्या का वर्णन कर कर्मठता तथा श्रम की महत्ता बताई है, गुरु गोरखनाथ के योगदान को स्पष्ट करने की दृष्टि से योग एवं ध्यान-मंजरी की रचना की है। सूर्यस्तवन द्वारा उसकी तेजस्विता एवं ऊर्जस्विता के लोक-मंगलकारी पक्ष को प्रस्तुत किया है। इसी अध्याय में मैंने ईसरदास रचित छंदों, गीतों एवं अष्टपदी पर चर्चा भी की है, जो जन-साधारण में अत्यधिक प्रचलित है। इन छंदों, गीतों में मनुष्य को नीति एवं सदाचार का उपदेश दिया गया है। संसार की असारता तथा क्षणभंगुरता को प्रतिपादित कर प्रभु-भजन हेतु प्रेरणा दी गई है। इस सम्बन्ध में एक सुपंखरो गीत उदाहरण स्वरूप प्रस्तुत है :

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

कूड़ौ देवरौ मंडाण मूल गीरिमेर सबै कूड़ौ,
कूड़ौ है जमीं को पिण्ड कूड़ौ अहंकार,
कूड़ौ है कोरंभ अंब पवन्न जमाव कूड़ौ,
गिरधारी नांहि कूड़ौ एक ही गोपाळ ।।१।।

खोटौ माल खजाना को कोर वेर सबै खोटौ ।
बाजीयां तबेलौ खोटौ खोटौ त्रिया बन्द ।
खोटौ काम जड़ित्रां को नंग को वणाव खोटौ,
मोटौ खोटौ नाहि एक बाल ही मुकुन्द ।।२।।

झूठौ हेत बंधवां को गोत रो कुटुम्ब झूंठौ,
मात-पिता सबै झूंठौ झूंठौ है मलक,
झूंठौ लाभ साहरां को पुत्र-परिवार झूंठौ,
एक झूंठौ नांहि एक आतमा अलख्ख ।।३।।

काचौ काम केलकारी मिनाकारी काम काचौ,
काया को वणाव काचौ काचौ सबै काय,
काचौ राज इन्द्र ही को आप ही ब्रह्माण्ड काचौ,
साचौ बाबा साचौ एक ईसरा को साम ।।४।।

विषय-वैविध्य, छंद वैभिन्य एवं भाव-गांभीर्य की पूर्ण जानकारी ईसरदास जी प्रणीत फुटकर रचनाओं के अध्ययन के बिना मिल ही नहीं सकती ।

पंचम् अध्याय में ईसरदासजी की अनूठी काव्य-प्रतिमा की परिचायक एवं अति प्रसिद्ध वीरता परक-कृति 'हालां झालां रा कुण्डळिया' का मूल्यांकन किया गया है । यह वह कृति है जिसकी बराबरी की कृति राजस्थानी साहित्य तो क्या विश्व-वाङ्मय में दुर्लभ है । हिन्दी-जगत् में अत्यधिक प्रसिद्धि प्राप्त महाकवि सूर्यमल्ल मिश्रण की कृति 'वीर सतसई' में चित्रित अनेक दृश्य इस कृति की जूठन प्रतीत होते हैं । 'हालां झालां रा कुण्डळिया' वीरत्व व्यंजक एकमात्र ऐसा ग्रन्थ है, जिसमें कहीं भी अतिशयोक्ति पूर्ण वर्णन नहीं है । समस्त दृश्य एवं बिम्ब स्वाभाविक तथा विश्वनीय लगते हैं । इस ऐतिह्यवृत प्रधान काव्य का प्रत्येक छंद स्वतन्त्र अस्तित्व रखते हुए भी कथा सूत्र में पिरोया हुआ है । इस ग्रन्थ में कहीं वीर को युद्ध के लिए प्रेरित किया गया है, कहीं शत्रुदल को अतिथि स्वरूप बताकर उनकी खातिरी करने की बात कही गई है, कहीं घोड़ों की हिनहिनाहट सुनाई दे रही है, कहीं तलवारों-भालों की झनझनाहट गूंज रही है और कहीं सिंधुराग सुनाई पड़ता है । 'हालां झालां रा कुण्डळियां' की प्रशंस्य विशेषता यह है कि कवि ने कुछ दृश्यों में वीर के साथ-साथ शृंगार रस का सुंदर परिपाक किया है । मातृभूमि-प्रेम, स्वाधीनता-प्रेम, स्वाभिमान, वचन-निर्वाह,

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

शरणागत-वत्सलता ग्रादि को वीर की सच्ची सम्पत्ति के रूप में विवेचित किया गया है। यह ग्रन्थ वीर को एक ही शिक्षा देता है कि मृत्यु से कभी मत डरो। इसके प्रणेता के ग्रनुसार बाकी सभी पर्व व्यर्थ हैं, केवल मरण-त्यौहार ही मांगलिक पर्व है। इसमें यही संदेश दिया गया है कि पार्थिव शरीर तो नश्वर है ग्रतः मनुष्य को इस पंचभूत शरीर की ग्रपेक्षा यशः काया को सदा सर्वदा के लिए जीवित रखने हेतु प्रयत्नशील रहना चाहिए। यहां कुछ ऐसे विशिष्ट उदाहरण प्रस्तुत किये जा रहे हैं जो इस ग्रन्थ की महत्ता में चार चांद लगाते हैं :

(१) यशःकाया को ग्रमर बनाने हेतु सलाह :
मरदां मरणौ हक्क है ऊबरसी गल्लांह।
सापुरसां रा जीवणा थोड़ा ही भल्लांह ।।
भलां थौड़ जीवियां नाम राखै भवां।
खेल ऊभारवै भागलां सिर खवां ।।
कळ चड़ै जोय चंद जस नामौ करै।
मरद संत्या जिकै ग्राय ग्रवसर मरै ।।[15]

(२) वीर ग्रौर श्रृंगार का समन्वित सुन्दर परिपाक :
सेल घमोड़ा किम सह्या किम सहिया गजदंत।
कठिण पयोहर लागतां कसमसतौ तू कंत ।।
कंत सूं ग्रोळंबो दियौ इम कामणी।
ग्रैठा घर ग्राज रा केम सहिया ग्रणी ।।
ईखता ग्राप नारंग फळ ग्राकरा।
सह्या किम कंत ग्रे घाव घट सेल रा ।।[16]

(३) शत्रुदल को ग्रतिथि स्वरूप मानना, घोड़ों की हिनहिनाहट :
घोड़ां हींस न भल्लिया पिय नींदड़ी निवारि।
वेरी ग्राया पावणां दळ-थंभ तूझ दुवारि ।।
दळ-थंभ तुझ दुवारि झुंझारि घवळ तणा।
घणां बिरदां लहण ग्राविया ग्ररि घणा ।।
घणां नींदाळवां नींद वारौ घणी।
तूंग नहं छै भली हींस घोड़ा तणी ।।"[17]

छठे ग्रध्याय में भक्त कवि ईसरदासजी की हाल ही में प्राप्त हुई एक ग्रति विशिष्ट रचना 'गुण निंदा स्तुति' का विवेचन प्रस्तुत किया गया है। उक्ति-वैचित्र्य की दृष्टि से यह ग्रन्थ बेजोड़ है। यद्यपि इसका वर्ण्य-विषय भी ईश्वर, तत्सम्बन्धी मान्यताएं ग्रौर ईश्वर प्रदत्त वरदानों से सम्बन्धित ही है, परन्तु कवि ने इसमें जिस प्रकार की शैली का प्रयोग किया है, वह वस्तुतः स्तुत्य हैं। वचन-वक्रता एवं व्यंग्यात्मकता इस काव्य का विशिष्ट गुण है। निन्दा के

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

व्याज से प्रभु की महिमा का ही बखान किया गया है। इस ग्रन्थ में कवि ने अपने आराध्य से मित्रवत् बातचीत की है। उससे हँसी-मजाक की है, मीठी चुटकियां ली हैं और कहीं-कहीं मृदु उपालम्भ भी दिये हैं। राजस्थानी साहित्य में इस शैली में रचित काव्य नगण्य ही है। यह ग्रन्थ ईसरदासजी की प्रभु चरणों में अटूट श्रद्धा, अद्वितीय भक्ति भावना और विशिष्ट कवित्व प्रतिभा का परिचायक है। इस कथन की पुष्टि हेतु निम्न उदाहरण प्रस्तुत है :

पाछै है तूं अेक प्रभु, आगे है तूं अेक।
कोई तूं विण बीजै कियौ, आतम करण अनेक।।

× × ×

आप बवारे आपनां, आप तणे तण आप।
इवड़ै कांई पड़ियौ अनंत, सिरजण हार संताप।।

× × ×

केवल जोई ताहरी कमाई, लक्षमण जिसौ त्यागियौ भाई।
राम परहरी सीता राणी, अमया घणे आमणे आंणी।।

× × ×

धारे सोळ सहस घर नारी, चवै प्रेम हूं ब्रह्मचारी।

× × ×

नरहर न्याव भलौ ओ नांही, मारे त्यां तारे खिण मांही।

सप्तम अध्याय में निष्कर्ष रूप में मैंने यह प्रतिपादित किया है कि ईसरदास जी की भक्ति-भावना कहीं-कहीं सखा भावना से प्रेरित होते हुए भी दास्य भावना की है। इसी अध्याय में इनकी आध्यात्मिक एवं अन्य कई प्रकार की मान्यताओं पर टिप्पणी की गयी है। 'हालां झालां रा कुण्डळिया' ग्रन्थ का कलात्मक दृष्टि से मूल्यांकन पंचम अध्याय में ही कर दिया गया है। अतः इस अध्याय में अन्य ग्रन्थों से कतिपय उदाहरण प्रस्तुत कर आलोच्य कवि के काव्य के कलात्मक सौन्दर्य को उद्घाटित किया गया है। इस अध्याय के अंत में मैंने ऐसे अनेक सम्पूर्ण पद यथावत् प्रस्तुत कर दिये हैं, जो अन्यान्य साहित्यकारों द्वारा भक्त कवि ईसरदासजी के सम्बन्ध में समय-समय पर लिखे गये हैं। यह मेरा नया प्रयोग ही है। मेरा यह मानना है कि एक कवि दूसरे कवि से अत्यधिक प्रभावित होने पर ही उसकी प्रशस्ति में कुछ लिख सकता है, अन्यथा प्रायः कवि जन एक दूसरे की कमी की ओर अवश्यमेव इंगित करते हैं। इतने सारे कवियों ने ईसरदासजी के सम्बन्ध में पद लिखे हैं, इसी से ईसरदासजी की महत्ता स्वतः स्पष्ट हो जाती है।

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

इस प्रकार मैंने हिन्दी साहित्य जगत् के समक्ष अपने शोध-प्रबन्ध के माध्यम से एक ऐसे भक्त कवि एवं उसके कवित्व को प्रस्तुत किया है, जिसकी जानकारी अब तक केवल राजस्थान एवं गुजरात-वासियों को ही थी। इन्हें यहां 'ईसरा परमेसरा' के सम्बोधन द्वारा भले ही ईश्वर के तुल्य मान लिया गया हो, परन्तु हिन्दी साहित्य के इतिहास लेखकों ने इसका परिचय भी प्रस्तुत नहीं किया है। ऐसे-ऐसे श्रेष्ठ भक्तों एवं महाकवियों का विस्मृति के गर्त्त में छिपे रहना इनके लिए नहीं अपितु हमारे लिए दुर्भाग्यपूर्ण है, क्योंकि हम ही इनकी ज्ञान-गरिमा एवं अनुभवों के लाभ से वंचित रहते हैं। मेरे निजी दृष्टिकोण से तो यही बात औचित्यपूर्ण लगती है कि स्थानीय विश्वविद्यालयों को इसी प्रकार के शोध कार्य की अनुमति देनी चाहिए ताकि हम अपनी लुप्त हो रही प्राचीन कृतियों से परिचित हो सकें।

---

१. वहीवंचा श्री भीमदेव भारमल रावल् (मोरझर) वही, पृ० ६२
२. ईसरदास : हरिरस, छंद ६
३. वही, छंद १३
४. वही, छंद १९३
५. वही, छंद २८२
६. वही, छंद २४८
७. वही, छंद २६८
८. वही, छंद ५२
९. वही, छंद ५३
१० वही, छंद ३१
११. वही, छंद ३१६
१२. वही, छंद ३१९
१३. ईसरदास : देवियांण, छंद १
१४. वही, छंद ८५
१५. ईसरदास : हालां झालां रा कुंडलि़या : छंद ५०
१६. वही, छंद १९
१७. वही, छंद ३

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

हिन्दी एकांकी नाट्य साहित्य के परिप्रेक्ष्य में डा. रामकुमार वर्मा के एकांकी साहित्य का अध्ययन

शोभा जोशी

वर्ष १९८५ में पी-एच०डी० (हिन्दी) की उपाधि के लिए जोधपुर विश्वविद्यालय द्वारा स्वीकृत शोध-प्रबन्ध का सारांश

नाटक

भारतीय आचार्यों ने स्वरूप के आधार पर काव्य के दो भेद किये हैं–दृश्य काव्य और श्रव्य काव्य। जिन काव्यों का आनन्द सुनने अथवा पढ़ने से मिलता है, श्रव्य काव्य कहलाते हैं। इसके अतिरिक्त जो अभिनेय हों और जिन्हें देखकर आनन्द की प्राप्ति हो, वे दृश्य काव्य कहलाते हैं। दृश्य काव्य को रूपक भी कहते हैं और रूपक को ही नाट्य या नाटक कहते हैं।

एकांकी

एकांकी शब्द का अर्थ है–एक अंक वाला। आजकल हिन्दी में इस शब्द का प्रचलन अंग्रेजी के "वन एक्ट प्ले" के अर्थ में लिया जाता है। भारतीय साहित्य में वर्तमान एकांकी नाटकों का प्रचलन पाश्चात्य साहित्य की प्रेरणा से हुआ है। वर्तमान मशीनी युग में अत्याधिक व्यस्तता के कारण लोगों के पास इतना समय नहीं रहा कि वे लम्बे नाटकों से रसानुभूति कर सकें। आज का व्यस्त मानव कम समय में अधिक मनोरंजन प्राप्त करना चाहता है। यही कारण है कि इस शताब्दी में एकांकी नाटकों का प्रचलन बढ़ा है।

हिन्दी के विभिन्न विद्वानों ने एकांकी की परिभाषा अपने-अपने ढंग से ही की है। प्रो. सद्गुरुशरण अवस्थी एकांकी में एक सुनिश्चित लक्ष्य, एक ही घटना, परिस्थिति अथवा समस्या, सम्पन्न प्रवाह और निदर्शन में चातुरी मानते हैं। श्री उपेन्द्रनाथ "अश्क" ने एकांकी के लिए तीन आवश्यक बातें मानी हैं— (१) आकार तथा समय की लघुता (२) अभिनयशीलता और (३) रंग संकेतों की स्पष्टता। डा. रामकुमार वर्मा के अनुसार एकांकी में एक घटना होती है, और वह नाटकीय कौशल से ही कौतुहल का संचय करते हुए चरम

---

*यह शोध डा० (कुमारी) रमासिंह, प्रोफेसर एवं अध्यक्ष, हिन्दी विभाग, जोधपुर विश्वविद्यालय, जोधपुर के निर्देशन में किया गया।

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

सीमा तक पहुँचती है। उसमें कोई अप्रधान प्रसंग नहीं होता। संक्षेप में कहा जा सकता ह कि एकांकी एक अंक की वह नाट्रचना है जिसमें जीवन की एक समस्या, एक परिस्थिति या एक अंश का प्रभावपूर्ण चित्रण संवाद एवं अभिनय के रूप में प्रस्तुत किया जाता है।

तत्त्व और विशेषताएं

हिन्दी के आधुनिक एकांकीकारों से पाश्चात्य एकांकीकारों ने प्रेरणा प्राप्त कर साहित्य की इस विधा का विकास किया है और उसे स्वतंत्र रूप प्रदान किया है। फिर भी उसके मूल तत्त्व प्रायः वही हैं जो किसी नाटक या कहानी के होते हैं। इस विषय को लेकर आलोचकों तथा एकांकीकारों में काफी विवाद है। इन सब ने एकांकी के तत्त्वों और विशेषताओं को अपने-अपने ढंग से प्रस्तुत किया है।

डॉ. नगेन्द्र ने एकांकी की विशेषताओं के सम्बन्ध में लिखा है कि "एकांकी में हमें जीवन का क्रमबद्ध विवेचन न मिलकर उसके एक महत्त्वपूर्ण घटना, एक विशेष परिस्थिति अथवा एक उद्दीप्त क्षण का चित्र मिलेगा।" सेठ गोविन्ददास ने संकलन-त्रय को एकांकी का मुख्य तत्त्व माना है, चाहे वह हेर-फेर के साथ प्रयुक्त हुआ हो। डॉ. रामकुमार वर्मा के अनुसार "एकांकी में एक ही घटना होती है और नाटकीय कौशल से ही कौतुहल का संचय करती हुई चरम सीमा तक पहुँचती है। उसमें कोई अप्रधान प्रसंग नहीं रहता। एक-एक शब्द और एक-एक वाक्य प्राण की तरह आवश्यक है। पात्र चार या पांच ही होते हैं जिनका सम्बन्ध नाटक की घटना से रहता है। उसमें मनो-रंजन के लिए अनावश्यक पात्रों की गुंजाईश नहीं रहती।"

उपेन्द्रनाथ "अश्क" ने एकांकी के निम्न तत्त्वों को स्वीकार किया है: (१) दस मिनट से तीस मिनट की अवधि (२) रंग संकेत (३) कार्यगति अभिनय (४) संवाद (५) वातावरण (६) चरित्र-चित्रण (७) प्रकाश अथवा छाया का उचित प्रयोग।

डा. रामचरण महेन्द्र के अनुसार एकांकी के निम्नलिखित तत्त्व हैं: (१) मूल विचार (२) प्रभाव (३) समस्या या संदेश (४) कथा वस्तु का चित्रण (५) संघर्ष या द्वन्द्व (६) संकलन-त्रय (७) पात्र और चरित्र चित्रण (८) कथोपकथन (९) अभिनयशीलता (१०) रंग-मंच निर्देश और प्रभाव ऐक्य।

संस्कृत नाट्य-साहित्य के अनुसार नाटक के तीन तत्त्व हैं: वस्तु, नेता और रस-पाश्चात्य आलोचकों ने छह तत्त्व स्वीकार किये हैं: (१) कथानक (२) संवाद (३) पात्र (४) देश-काल (५) शैली, तथा (६) उद्देश्य।

उपर्युक्त विद्वानों के मतों का विवेचन करने के उपरान्त निष्कर्ष रूप में नाटक के निम्नलिखित तत्त्व स्वीकार किये जा सकते हैं:

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

(१) कथानक : कथानक एकांकी की आधारशिला है जिसपर उसके भवन का निर्माण होता है। कथानक का आधारभूत एक मुख्य घटना होती है और समस्त अन्वांतर घटनाएँ उसी की पोषक होती हैं। कथानक में वर्णात्मक तत्त्वों की अपेक्षा अभिनय तत्त्वों की प्रमुखता होनी चाहिए। संघर्ष या अन्तर्द्वन्द्व ही कथा का प्राण है।

(२) पात्र : यह एकांकी का दूसरा प्रमुख तत्त्व है। पहले अभिजात वर्ग का व्यक्ति ही एकांकी का पात्र बन सकता था परन्तु आधुनिक साहित्य में कोई भी पात्र बन सकता है। कथानक पात्रों के आधार पर चलता है। कथानक के अनुकूल पात्रों के चरित्र का विकास होता है। पात्रों की संख्या सीमित होनी चाहिए। इनमें अनावश्यक पात्रों की कोई उपयोगिता नहीं रहती।

(३) कथोपकथन या संवाद : संवाद या कथोपकथन एकांकी का ऐसा महत्त्वपूर्ण तत्त्व है जिसके बिना एकांकी का स्वरूप ही नहीं बन सकता। डॉ. रामकुमार वर्मा ने 'संवाद' को एकांकी की आत्मा माना है। उन्होंने कहा है कि "नाटककार का एक मात्र अस्त्र संवाद ही है जिससे वह अपने लक्ष्य को भेदता है।" एकांकी के संवाद संक्षिप्त, मर्मस्पर्शी, वाग्यवैग्ध्यपूर्ण प्रभावशाली, रोचक और स्वाभाविक होने चाहिए।

(४) संकलन-त्रय : एकांकी की शिल्प विधि का यह एक अनिवार्य अंग है। इसमें समय, स्थान और कर्म व्यापार इन तीनों का संकलन होता है। डॉ. रामकुमार वर्मा ने संकलन-त्रय की अनिवार्यता स्पष्ट करते हुए लिखा है कि "संकलन-त्रय एकांकी की मूल आत्मा है। जिस एकांकी में सत्य का निर्वाह नहीं वह एकांकी न होकर कुछ और है।"

(५) रंग-संकेत : एकांकी एक दृश्य काव्य है जो रंगमंच पर पात्रों द्वारा अभीनीत होता है। नाटककार अपनी रचना के अनुकूल उसका दृश्य विधान रंगमंच पर देखना चाहता है। इस उद्देश्य की पूर्ति के लिए रंग-निर्देश प्रस्तुत किया जाता है।

(६) वातावरण : इसके अन्तर्गत रीति-रिवाज, रहन-सहन के ढंग, पात्रों की वेष-भूषा, शिष्टाचार, आचार-व्यवहार, विचार-चिंतन, वार्तालाप की भाषा शैली आदि सभी बातें समाविष्ट हो जाती हैं। इससे कथावस्तु को स्वाभाविक वातावरण मिलता है।

(७) भाषा शैली : भाषा शैली एकांकी का महत्त्वपूर्ण तत्त्व है। नाटक की उत्कृष्टता एवं भावों के अनुरूप भाषा में गांभीर्य, चांचल्य, हास्य, व्यंग्य, मुहावरे तथा लोकोक्तियों का पुट होने से वह सजीव हो उठता है।

(८) उद्देश्य : एकांकी का सामान्य उद्देश्य मनोरंजन है। पर इससे आगे बढ़कर सूक्ष्मतर साहित्यिक अथवा कलात्मक उद्देश्य की पूर्ति के लिए एकांकी लिखे जाते हैं।

उद्‌भव और विकास : हिन्दी एकांकी का प्रारम्भ कब से माना जाय, इस विषय

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

में विद्वान एक मत हैं। कुछ विद्वान भारतीय नाट्य शास्त्र में ही इसका मूल-तत्त्व खोजते हुए भारतेन्दु युग से इसका विकास निर्धारित करते हैं। भारतेन्दु से पूर्व तक प्रणीत होने वाला समस्त नाट्य साहित्य पश्चिमी आदर्श पर लिखे गये। आधुनिक एकांकियों का अपना जो निजी स्वरूप है उसकी ओर किसी का ध्यान अभी तक नहीं गया था। अनेक वाद-विवादों के बाद निष्कर्ष रूप में हिन्दी एकांकी के विकास के क्रम को चार चरणों में विभाजित किया गया है :

(१) भारतेन्दु युग (१८७० से १९२८ तक) : हिन्दी साहित्य के इतिहास में भारतेन्दु सूर्य सदृश्य प्रकाशमान हैं। वे स्वयं एक महान् नाटककार थे। उनकी रचनाओं से हिन्दी नाट् साहित्य समृद्ध हुआ। उन्होंने एक ओर जहां कई संस्कृत और बंगला नाटकों का अनुवाद किया वहां दूसरी ओर कई मौलिक नाटक लिखे। इनके कुछ प्रसिद्ध नाटक हैं–

(१) पाखंड विखंड, (२) वैदिकी हिंसा हिंसा न भवति (३) धनंजय (१९३०), विजय (१९३०), (४) प्रेम जोगिनी (१९३२), (५) विषस्य विषमोषधम् (६) भारत दुर्दशा, (७) भारत जननी, (८) नील देवी, (९) अंधेर नगरी, (१०) प्रेम माधुरी इत्यादि। इनके समकालीन अन्य नाटककार पं. बालकृष्ण भट्ट (बाल विवाह, रेल का टिकट, खेल, कलिराज की सभा, शिक्षा-दान, आचार-विडम्बना), राधाकृष्ण दान, दुःखिनी बाला, वर्मालाप, दो एकांकी, महारानी पद्मावती, महाराणा प्रताप इत्यादि, अम्बिका व्यास, गौ संकट, कलियुग और घी, ललिता नाटिका, मन की उमंग इत्यादि। प्रताप नारायण मिश्र-प्रेम पुष्पावली, भारत दुर्दशा, मन की लहर, शृंगार विलास इत्यादि, तथा बदरी नारायण चौधरी, लाला काशीनाथ खत्री, किशोरी लाल गोस्वामी इत्यादि प्रसिद्ध हैं।

(२) द्विवेदी युग (१९२९ से १९३५ तक) : हिन्दी एकांकी के विकास के द्वितीय चरण में क्रांतिकारी परिवर्तन हुए। इस युग में एकांकी शब्द का प्रयोग होने लगा। इस युग में स्वदेश एवं स्वधर्म की भावना का पूर्ण विकास हो चुका था। यथार्थ नाटकों का प्रभाव बढ़ा। नई समस्याएँ, नये विचार तथा भाषा में नई दिशाएँ अपनाई जाने लगी। द्विवेदी युगीन नाटकाकरों में जयशंकर प्रसाद प्रतिनिधि एकांकीकार के रूप में स्वीकार किये जाते हैं। कुछ आलोचक इनके 'एक घूंट' एकांकी को हिन्दी साहित्य का प्रथम एकांकी मानते हैं। कथानक, पात्र और शिल्प की दृष्टि से यह हिन्दी में एक नया प्रयोग था। इस समय के अन्य एकांकीकार हैं–पं. राधेश्याम कथावाचक, जी.पी. श्रीवास्तव, पांडेय बेचैन शर्मा 'उग्र', बद्रीनारायण भट्ट, रामनरेश त्रिपाठी, प्रेमचन्द (प्रेम की वेदी), सुदर्शन इत्यादि।

(३) प्रयोगवादी युग (उत्थान युग १९६३ से १९४५ तक) : इस युग में समाज में विशेष चेतना आई और इस जागृति का मुख्य नवीन कारण नवीन शिक्षा थी। अंग्रेजी साहित्य के अध्ययन का विशेष प्रभाव रहा। जन साधारण के जीवन

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

से सम्बन्धित एकांकी लिखे जाने लगे जिनमें अनेक शैलियाँ अपनाई गई। इस युग के एकांकीकारों को तीन श्रेणियों में विभाजित किया जा सकता है।

१. पहले वर्ग के एकांकीकार बंगला या अंग्रेजी के प्रभाव से मुक्त थे। इनकी रचनाएँ संस्कृत प्रणाली पर ऐतिहासिक एकांकी हैं। ये आधुनिक शिल्प से या तो परिचित नहीं थे या मुक्त रहना चाहते थे। इस श्रेणी के एकांकीकार हैं–वृन्दावनलाल वर्मा, प्रो. शतगुरुशरण अवस्थी, पं. गोविन्दवल्लभ पंत, चतुरसेन शास्त्री, डॉ. सत्येन्द्र, चन्द्रगुप्त विद्यालंकार, जैनेन्द्र कुमार इत्यादि।

२. दूसरे वर्ग में वे एकांकीकार आते हैं जिन्होंने शिल्प, विषय, विचार, टेकनिक समस्याएँ इत्यादि सब कुछ पाश्चात्य एकांकियों से ग्रहण किया। इस श्रेणी के एकांकीकार हैं–भुवनेश्वर प्रसाद, प्रो. धर्म प्रकाश आनन्द, गणेश प्रसाद द्विवेदी इत्यादि।

३. तीसरे वर्ग में वे एकांकीकार आते हैं जिन्होंने पाश्चात्य नाटकों तथा कुछ मौलिकता लिए हुए एकांकियों की रचना की। इस श्रेणी के एकांकीकार हैं–डॉ. रामकुमार वर्मा, उपेन्द्रनाथ अश्क, सेठ गोविन्ददास, उदयशंकर भट्ट, लक्ष्मी नारायण मिश्र, विष्णु प्रभाकर, भगवती चरण वर्मा, जगदीश चन्द्र इत्यादि।

४. आधुनिक युग(१९४६ से १९६७ तक) : १९४५ के बाद एकांकी ने एक नये युग में प्रवेश किया। इस युग में अनेक वैज्ञानिक आविष्कार हुए और मानव के समय तथा शक्ति की बचत हुई। दहेज प्रथा, स्वदेश प्रेम, अछूतोद्धार, पीड़ितों की सेवा, इत्यादि से सम्बन्धित एकांकियों की रचना होने लगी। इस युग के हिन्दी एकांकी हमारे जीवन के बहुत निकट हैं। वर्तमान युग के प्रसिद्ध एकांकीकार निम्नलिखित हैं : विष्णु प्रभाकर, डॉ. लक्ष्मीनारायण लाल, विनोद रस्तोगी, जयनाथ नलिन, राजेन्द्रकुमार शर्मा, सत्येन्द्र शरत, मोहन राकेश, रामवृक्ष बेनीपुरी, धर्मवीर भारती, विपिनकुमार अग्रवाल, विमला लूथरा, इत्यादि।

डॉ. वर्मा के एकांकियों का संक्षिप्त परिचय

हिन्दी एकांकीकारों में डॉ. रामकुमार वर्मा का स्थान सर्वोपरि तथा महत्त्वपूर्ण है। यद्यपि कुछ आलोचक हिन्दी एकांकी का आरंभ भारतेन्दुजी से तथा कुछ प्रसादजी के "एक घूँट" एकांकी से मानते हैं परन्तु वस्तुतः हिन्दी का वर्तमान एकांकी शिल्प की दृष्टि से भारतेन्दु और प्रसाद की कृतियों से सर्वथा भिन्न है और पाश्चात्य टेकनिक का अनुसरण करता है। पाश्चात्य टेकनिक पर आधारित हिन्दी एकांकियों को साहित्य क्षेत्र में लाने का श्रेय डॉ. रामकुमार वर्मा को है। इन्होंने बहुमुखी प्रतिभा का परिचय दिया है। इन्होंने अब तक सौ से अधिक एकांकियों की रचना की है जो लगभग पन्द्रह संकलनों में प्रकाशित हुए हैं। सन् १९३० में इनका प्रथम एकांकी "बादल की मृत्यु" प्रकाशित हुआ था।

डॉ. रामकुमार वर्मा के एकांकियों को निम्नलिखित क्रमों में विभाजित किया

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

जा सकता है :

१. ऐतिहासिक, २. सामाजिक, ३. साहित्यिक, ४. वैज्ञानिक, ५. मनोवैज्ञानिक या मनोविश्लेषणात्मक, ६. अन्य ।

ऐतिहासिक नाटकों की कथावस्तु

(क) दीपदान : इस एकांकी में वर्माजी ने इतिहास प्रसिद्ध पन्नाधाय की स्वामी-भक्ति तथा त्याग का चित्रण किया है । महाराणा सांगा की मृत्यु के उपरान्त उनके छोटे पुत्र १४ वर्षीय उदयसिंह को राज्य का उत्तराधिकारी नियुक्त किया जाता है । बनवीर को उसका संरक्षक बनाया जाता है । परन्तु वह उदयसिंह की हत्या कर स्वयं राजा बनना चाहता है । पन्नाधाय को बनवीर की यह चाल मालूम हो जाती है और वह अपने पुत्र चन्दन का बलिदान कर उदयसिंह को बचाने में सफल हो जाती है ।

(ख) रात का रहस्य : मगध सम्राट बिम्बसार अपने पुत्र की उदण्डता से तंग आकर सिंहासन त्याग देते हैं और बड़ी रानी बासवी के साथ एक कुटिया में एकान्तवास करने लगते हैं । परन्तु अजातशत्रु वहां भी उनको शान्ति से नहीं रहने देता और उन पर राजद्रोह का अभियोग लगाकर उनको मृत्युदण्ड सुना देता है ।

(ग) नाना फड़नवीस : इस एकांकी में सन् १७७३ में पेशवा पद प्राप्त करने के लिए राघोबा द्वारा रचित षड़यंत्र में आनन्दी बाई द्वारा "ध" का "माँ" बनाकर नारायण राव का खून करना वर्णित है ।

(घ) सोन का वरदान : मगध सम्राट बिम्बसार की मृत्यु के बाद अशोक को मगध का उत्तराधिकारी बनाया जाता है जिससे दूसरे भाई ईर्ष्या करने लगते हैं । सोन नदी के तट पर सभी भाई अशोक को मारने की योजना बनाते हैं परन्तु अशोक अपनी बुद्धिचातुरी से भाइयों के विद्रोह को स्नेह में परिवर्तित कर देता है ।

(ङ) औरंगजेब की आखिरी रात : इतिहास में औरंगजेब की अनेक क्रूरताएँ वर्णित हैं । उसने सल्तनत प्राप्त करने के लए अपने पिता को कैद किया । भाइयों की हत्या करवाई । यहां तक कि अपने पुत्रों को भी अपने से दूर रखा । मृत्यु की रात में औरंगजेब को अपने इन कुकृत्यों पर पश्चाताप होता है ।

इन सब के अतिरिक्त कादम्ब का विषय, शिवाजी, उदयन, मर्यादा की वेदी पर, तैमूर की हार, भाग्य नक्षत्र, चारु मित्रा, दुर्गावती, समुद्रगुप्त, पराक्रमांक सम्राट अउद्यन पर अभियोग, कलंक रेखा, कृपाण की धार, पृथ्वीराज की आँखें, कौमुदी महोत्सव इत्यादि प्रसिद्ध ऐतिहासिक एकांकी नाटक हैं ।

सामाजिक एकांकी

डॉ. रामकुमार ने अपने सामाजिक एकांकियों में सामाजिक समस्याओं को

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

उठाकर नई प्रेरणा प्रदान की है। इनके निम्नलिखित सामाजिक एकांकी प्रसिद्ध हैं–परीक्षा, रजनी की रात, रूप की बीमारी, १८ जुलाई की शाम, एक तोले अफीम की कीमत, रेशमी टाई, नहीं का रहस्य, चम्पक, एक्ट्रेस, दस मिनट, जीवन का प्रश्न, शहनाई की शर्त, सोने के भगवान, समय चक्र, इत्यादि।

कथावस्तु

(१) परीक्षा : पचास वर्षीय प्रोफेसर केदारनाथ अपनी बीस वर्षीया शिष्या रत्ना से विवाह कर लेते हैं। प्रोफेसर के मित्र डॉ. रूद्र के मन में शंका उठती है कि क्या रत्ना को अपने पति से प्रेम है ? वे उसकी परीक्षा लेते हैं और वह अपने प्यार की कसौटी पर खरी उतरती है।

(२) रजनी की रात : रजनी समाज से घृणा कर उससे दूर रहना चाहती है परन्तु आनन्द रजनी के विचारों से सहमत होते हुए भी समाज में रहकर उससे लड़ना चाहता है। अन्त में रजनी आनन्द के विचार से सहमत हो जाती है।

(३) रूप की बीमारी : यह आधुनिक युवक रूप के रोमांस पर आधारित एकांकी है। रूप एक निर्धन परिवार की लड़की से प्रेम करने लगता है तथा बीमारी का बहाना बनाकर उस लड़की को पाना चाहता है। अन्त में डॉक्टरों की योजना से अपने इस कार्य में सफल हो जाता है।

(४) एक तोले अफीम की कीमत : दहेज प्रथा को लेकर इस एकांकी की रचना की गई है। मुरारी मोहन एक शिक्षित युवक है। उसके पिता दहेज के लोभ में उसका विवाह एक अनपढ़ लड़की से करना चाहते हैं। मुरारी मोहन अपने पिता का विरोध नहीं कर सकता, अतः अफीम खाकर मर जाना चाहता है। विश्व मोहिनी एक युवती है। उसका विवाह जिस युवक से निश्चित होता है वह छह हजार रुपये माँगता है। विश्व मोहिनी अपने पिता को संकट से उबारने के लिए अफीम खाकर मर जाना चाहती है। वह अफीम लेने के लिए मुरारी मोहन के पास आती है। वहां दोनों में विचार-विमर्श होता है और दोनों आपस में विवाह करने का निश्चय करके आत्महत्या का विचार त्याग देते हैं।

(५) रेशमी टाई : नवीनचन्द्र राय टालसटाय और गांधी के विचारों से प्रभावित होते हुए भी एक गंदी आदत का शिकार है। उससे चोरी करने की आदत नहीं छूटती है। वह अपने मित्र की दूकान से एक अधिक रेशमी टाई ले आता है और पत्नी के आग्रह करने पर भी नहीं लौटाता है। एक दिन खादी बेचने वाली युवती का कपड़ा चुरा लेता है। अन्त में अपनी पत्नी की प्रेरणा से इस गंदी आदत को हमेशा के लिए छोड़ देने की प्रतिज्ञा करता है।

साहित्यिक एकांकी

महाकवि सूरदास, महाकवि तुलसीदास, महाकवि भारवि आदि।

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

वैज्ञानिक

चन्द्रलोक का यात्री, प्रगति के चरण इत्यादि।

पात्र

हिन्दी एकांकी साहित्य का महत्त्वपूर्ण तत्त्व चरित्र विधान है। एकांकियों के नाटकीय कार्य व्यापार का वहन करते हुए अपने संवादों द्वारा पात्र ही एकांकी की कथावस्तु को सजीव और प्रत्यक्ष रूप प्रदान करते हैं। डॉ. रामकुमार वर्मा के लगभग सभी एकांकियों के पात्र अपने उद्देश्य को पूर्ण करने में सफल हुए हैं। उन्होंने अपने एकांकी नाटकों में उन पात्रों को विशेष स्थान दिया है जो हमारे जीवन में आदर्श स्थापित कर सकें। ऐतिहासिक नाटकों में इतिहास प्रसिद्ध महापुरुष पात्र हैं तो सामाजिक एकांकियों में काल्पनिक। साहित्यिक एकांकियों में सूर, तुलसी, भारतेन्दु, भारवी इत्यादि पात्र हैं। ये समस्त पात्र अपने आदर्श चरित्र द्वारा हमें नया जीवन, नई चेतना और नई प्रेरणा प्रदान करते हैं। सामाजिक पात्रों— हरिनारायण, प्रो. केदार, उषा, रजनी, प्रमोद, मुरारी, मोहन, महादेव, आनन्द, कवि किशोर, विश्व मोहनी, करुणा के माध्यम से हमें छुआछूत, आदि सामाजिक कुरीतियों को दूर करने की प्रेरणा मिलती है। ऐतिहासिक पात्रों से अहंकार को दूर करने की, देश प्रेम की, आत्म सम्मान की रक्षा करने की तथा अन्याय के विरोध में संघर्ष करने की प्रेरणा मिलती है।

भाषा शैली

एकांकी प्रत्यक्ष प्रदर्शन का साहित्य है और संवाद अभिव्यक्ति का सशक्त माध्यम। संवादों की अभिव्यक्ति भाषा द्वारा होती है, अतः भाषा जितनी सशक्त होगी, संवाद उतना ही प्रभावशाली होगा। एकांकी की सफलता उसकी अभिनेयता पर निर्भर है अतः उसकी भाषा शैली अभिनेय के अनुरूप होनी चाहिए। डॉ. रामकुमार वर्मा के एकांकियों की भाषा पात्रों के अनुकूल है। एक ओर जहाँ ऐतिहासिक मुगल पात्रों की भाषा उर्दू मिश्रित हिन्दी है वहां दूसरी हिन्दू पात्रों की भाषा शुद्ध हिन्दी है। साहित्यिक पात्रों की भाषा भी शुद्ध तत्सम शब्दों से युक्त साहित्यिक भाषा है। निम्न वर्गों के पात्रों की भाषा शुद्ध ग्रामीण है। "बादल की मृत्यु" तथा "चम्पक" इत्यादि एकांकियों की भाषा शुद्ध काव्यात्मक है। "एक्ट्रेस" एकांकी प्रकृति वर्णन में काव्य तत्त्व की भरमार है। "दस मिनट" की भाषा शैली करुणा से ओतप्रोत तथा भावात्मक है। ऐतिहासिक यौद्धाओं की भाषा ओज परिपूर्ण है। डॉ. वर्मा ने भाषा के सम्बन्ध में लिखा है कि रंग मंच पर अधिक से अधिक स्वाभाविकता उपस्थित करने की आवश्यकता होती है। अतः पात्रों के मनोविज्ञान और उनके मुख की भाषा को यथावत् ही रहना चाहिये। वर्मा वस्तुतः अपने इस उद्देश्य में पूर्ण रूप से सफल हुए हैं।

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

अभिनेयता

अभिनय एकांकी ही नहीं समस्त दृश्य काव्य का प्राणप्रद तत्त्व है। इसके बिना साहित्य नाटकीय नहीं हो पाता है। अभिनय के द्वारा ही एक दूसरे की स्थिति का रंगमंच पर प्रस्तुतीकरण किया जाता है। अतः एकांकी में रचना का आयोजन अभिनय की सुविधा के आधार पर ही किया जाना चाहिए। वर्माजी ने अपने एकांकियों में इन्हीं बातों को ध्यान में रखते हुए पाश्चात्य एकांकी टेकनिक तथा शिल्प का प्रयोग किया है। निर्देशक की सुविधा के लिए उन्होंने अपने एकांकी नाटकों में पर्याप्त मात्रा में रंग निर्देश दिये हैं। इनके एकांकियों में वातावरण तथा पृष्ठभूमि का पूरा विधान है। यही कारण है कि इनके अधिकांश एकांकियों का रंगमंच पर सफलता पूर्वक अभिनय हुआ है। कुछ एकांकियों का आकाशवाणी द्वारा भी अभिनय हुआ है। वर्माजी के लगभग सम्पूर्ण एकांकी साहित्य अभिनयता से परिपूर्ण हैं।

एकांकी जगत में वर्माजी का स्थान

हिन्दी एकांकीकारों में डॉ. रामकुमार वर्मा का स्थान सर्वोच्च है। यद्यपि कुछ आलोचकों के अनुसार हिन्दी एकांकी का आरंभ भारतेन्दु युग से तथा कुछ प्रसाद के "एक घूंट" एकांकी से मानते हैं परन्तु आधुनिक शिल्प तथा टेकनिक पर आधारित एकांकियों को साहित्य के क्षेत्र में लाने का श्रेय डा. रामकुमार वर्मा को है। इनका प्रथम एकांकी "बादल की मृत्यु" १९३० में प्रकाशित हुआ था जो खड़ी बोली का प्रथम एकांकी माना जा सकता है। डॉ. वर्माजी वस्तुतः आधुनिक एकांकी साहित्य के जनक हैं। इन्होंने ऐतिहासिक, सामाजिक, साहित्यिक, राजनैतिक, वैज्ञानिक तथा व्यंग्य विनोद पर आधारित सौ से भी अधिक एकांकियों की रचना की है। शिल्प और विषय दोनों दृष्टियों से एकांकी लेखन के क्षेत्र में डॉ. वर्मा ने अपनी बहुमुखी प्रतिभा का परिचय दिया है। ऐतिहासिक एकांकियों से तत्कालीन संस्कृति और सामाजिक वातावरण का परिचय मिलता है तो सामाजिक एकांकियों में समाज के समस्यामूलक चित्रों का यथार्थ चित्रण है। सभी एकांकी अभिनेयता से परिपूर्ण हैं। वस्तुतः एकांकी जगत में डॉ. वर्माजी का स्थान अत्यन्त महत्त्वपूर्ण है।

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

राजस्थानी साहित्य में कृष्णभक्ति काव्य

श्रीमती तारा भाटी

वर्ष १९८५ में पी-एच० डी० (हिन्दी) की उपाधि के लिए
जोधपुर विश्वविद्यालय द्वारा स्वीकृत शोध-प्रबन्ध का सारांश*

प्रथम अध्याय : राजस्थानी साहित्य और कृष्ण भक्ति

क. राजस्थानी साहित्य की परम्परा

डिंगल साहित्य राजस्थानी साहित्य का पर्याय माना जाता रहा है। चारणों और जैन मुनियों ने इस साहित्य को समृद्धिशाली बनाया। राजस्थान में ही नहीं समूचे भारत में राजस्थानी भाषा में साहित्य का सृजन और विकास होता रहा है। पं० नरोत्तम स्वामी ने राजस्थानी साहित्य को प्रमुख तीन शैलियों में बाँटा है : क. जैन शैली, ख. चारण शैली ग. लौकिक शैली। राजस्थानी साहित्य का यहाँ व्यापक अर्थ ग्रहण किया जाना चाहिए। अतः राजस्थान में रचित संस्कृत, प्राकृत, अपभ्रंश, ब्रज, खड़ी बोली, उर्दू भाषाओं के साहित्य को चाहे वह कहीं भी रचा गया हो उसे राजस्थानी के नाम से अभिहित किया जाता है। इसके साथ ही प्रत्येक विषय पर रचा गया राजस्थानियों का साहित्य भी राजस्थानी साहित्य में ही आता है।

राजस्थानी साहित्य का आरम्भ नरोत्तम स्वामी के अनुसार विक्रम संवत् ८५० से माना जाता है। उद्योतन सूरी ने जालौर में कुवलय माला नामक ग्रन्थ लिखा था। राजस्थानी भाषा का विकास काल विक्रम संवत् ८०७ से अद्यावधि माना जाता है।

ख. राजस्थानी साहित्य में भक्ति

भक्ति शब्द भज् धातु में क्तिन् प्रत्यय जोड़ने से बना, जिसका अर्थ है इष्टदेव को भजना, स्मरण करना और गुणगान करना। उपनिषदों में कहा गया है कि मन को भगवान में पूर्णरूप से केन्द्रित करके किसी फल की इच्छा किये बिना उनका निरन्तर भजन करना ही भक्ति है। राजस्थानी साहित्य आरम्भ

*यह शोध डा० राज कृष्ण दूगड़, एसोसियेट प्रोफेसर, हिन्दी विभाग, जोधपुर विश्वविद्यालय, जोधपुर के निर्देशन में किया गया।

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

में सन्तों और जैन मुनियों द्वारा रचा गया है। यहां अनेक धार्मिक सम्प्रदायों का जन्म हुआ जिनसे प्रेरित होकर व्यापक धार्मिक साहित्य लिखा गया। इन सम्प्रदायों में जसनाथी सम्प्रदाय, चरणदासी, राम स्नेही सम्प्रदाय और दादू पंथ आदि प्रमुख हैं। इन सम्प्रदायों के अतिरिक्त वल्लभ सम्प्रदाय और स्वामी रामानुजाचार्य का प्रभाव भी रहा जिससे कृष्ण और राम भक्ति को बढावा मिला।

ग. राजस्थानी में श्री कृष्ण भक्ति का प्रसार

श्री कृष्णोपासना सम्बन्धी प्राचीनतम पुरातात्विक प्रमाण राजस्थान में चित्तौड़ के निकट मिलते हैं। डॉ. वासुदेव शरण अग्रवाल के अनुसार वहां का वासुदेव मन्दिर प्राचीनतम वैष्णव मन्दिर माना जाता है। इसके अतिरिक्त कई शिला-लेख और पत्थरों पर खुदी मूर्तियां कृष्ण भक्ति का प्रमाण हैं। किशनगढ़ में निम्बार्काचार्य के प्रभाव से अनेक मन्दिर निर्मित हुए। नाथद्वारा का श्रीनाथजी का मन्दिर भी कृष्ण भक्ति के विकास में सहायक सिद्ध हुआ। राजस्थान के प्रत्येक वर्ग और जाति के लोग कृष्ण पूजा की ओर आकृष्ट हुए।

घ. राजस्थानी कृष्ण भक्ति काव्यधारा

राजस्थानी साहित्य में कृष्ण भक्ति काव्य का मूल एवम् प्रमुख प्रेरणा स्रोत श्री मद्भागवत महापुराण आदि माने जाते हैं। वेद व्यास से चली आती हुई परम्परा चारण कवियों तक पहुँची। अनेक राजा महाराजाओं का आश्रय पाकर इन चारण भक्त कवियों ने अनेक कृष्ण काव्यों का सृजन किया। इन्होंने कृष्ण की अनेक लीलाओं और उनके वीर वेश को अपने काव्य में चित्रित किया। इन कवियों पर विष्णु पुराण और हरिवंश पुराण का प्रभाव भी रहा। राजस्थानी भाषा में संस्कृत के सुप्रसिद्ध कृष्ण काव्यों का अनुवाद भी किया गया। जैसे गीत गोविन्दम् और गीता का रसमय अनुवाद उपलब्ध होता है। कृष्ण भक्त कवियों ने श्री कृष्ण का रूप लेकर अपने शूरवीर नरेशों का ही चित्रांकन किया है। अत्याचारी मुगल शासकों को राक्षस मानने की परम्परा भी प्रचलित रही है। अतः राजस्थानी कृष्ण भक्ति साहित्य के अन्तर्गत वीर रस एवम् रुक्मिणी प्रसंग से श्रृंगार रस की प्रधानता रही है।

द्वितीय अध्याय : राजस्थानी कृष्ण भक्त कवि

प्रमुख प्रबन्धकार

क. प्रबन्ध काव्य : स्वरूप निर्धारण

प्राचीन भारतीय साहित्याचार्यों ने काव्य के दो प्रधान भेद किये हैं-१. श्रव्य काव्य

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

२. दृश्य काव्य। श्रव्य काव्य के पुनः दो भेद किये गये हैं- प्रबन्ध और मुक्तक। प्रबन्ध काव्य में जीवन की व्यापक घटनाओं को लेकर महाकाव्य लिखे गये और किसी एक घटना को लेकर खण्ड काव्यों की रचना की गई। महाकाव्य में सर्ग बद्धता, महान् चरित्र और विजयी नायक की महत्त, शिष्ट नागर प्रयोग और अलंकृति, जीवन के विविध रूपों, अवस्थाओं और घटनाओं का चित्रण नाटकीय गुण, प्रति व्याख्या रहित होना अर्थात संगठित कथानक और प्रभाव की अन्विति। इन विशेषताओं के आधार पर राजस्थानी प्रबन्ध काव्य लिखे गये थे। पृथ्वीराज रासो, बीसल देव रासो और बेलि किसन रुक्मिणी री जैसे सैंकड़ों प्रबन्ध काव्यों की आयोजना यहाँ हुई है।

ख. प्रमुख प्रबन्ध काव्यकार

राजस्थानी कृष्ण भक्ति काव्य परम्परा के अन्तर्गत जो प्रतिनिधि काव्य ग्रन्थ उपलब्ध होते हैं, संक्षेप में उनका चित्रण निम्नलिखित प्रकार से किया जा सकता है : १. पदमदास कृत रुक्मिणी मंगल : इस ग्रंथ का अपर नाम "किसन जी रो व्याहलो" मिलता है। राजस्थान में अनेक ब्राह्मण और जोगी परम्परागत रूप से व्याहला गाते हैं। "रुक्मिणी मंगल" गेय होने के कारण निरन्तर परिवर्तित और परिवर्द्धित होता रहा है, इसलिए इसकी अनेक प्रतियां मिलती हैं। काव्य के आरम्भ में सरस्वती वन्दना और तैंतीस करोड़ देवी-देवताओं की स्तुति की गई है। मूल कथा का आरम्भ कुन्दनपुर नगर वर्णन और राजा भीष्मक के परिवार व दरबार के चित्रण से हुआ है। रुक्मिणी के बड़ी होने पर उसके विवाह का आयोजन किया जाता है तब शिशुपाल को लगन पत्रिका भेजी जाती है। कवि ने रुक्मिणी के सरोवर स्नान का प्रसंग जोड़कर यह बताया है कि श्री कृष्ण ने डूबती हुई रुक्मिणी का उद्धार किया और स्वयं रुक्मिणी ने कृष्ण से विवाह का वचन दिया। लेकिन शिशुपाल को लगन पत्रिका भेजी जाने के कारण वह यथा-समय विवाह के लिए कुन्दनपुर पहुँच जाता है। रुक्मिणी उदास होकर कृष्ण को सूचना भेजती है और श्री कृष्ण पहुँचकर रुक्मिणी को अपने रथ में बिठा लेते हैं। तब शिशुपाल और कृष्ण में युद्ध होता है और अन्त में कृष्ण विजयी होकर रुक्मिणी का हरण करके ले जाते हैं। कृष्ण रुक्मिणी का विवाह विधि पूर्वक सम्पन्न होता हैं। देवकी, सुभद्रा, वसुदेव आदि वर वधू का स्वागत करते हैं। रचना के अन्त में मंगल का महात्म्य दिया गया है।

२. करमसी सांखला कृत श्री कृष्ण जी री बेलि : प्रस्तुत बेलि को विक्रम संवत् १६३४ को लिपिबद्ध किया गया था, जिससे प्रकट होता है कि बेलि की रचना इससे पहले हो चुकी थी। विद्वानों ने लगभग संवत् १६०० के आसपास इसका रचनाकाल अनुमानित किया है। इस बेलि में बेलियो गीत के २२ दोहे ही उपलब्ध होते हैं। डॉ. हीरालाल माहेश्वरी ने लिखा है कि यह सम्पूर्ण

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

रचना का अन्तिम अंश प्रतीत होता है किन्तु रुक्मिणी का नखसिख वर्णन आगे की वेलियों में आरम्भ में मिलता है इसीलिए यह आरम्भ की रचना भी हो सकती है। इस लघु ग्रन्थ में रुक्मिणी के अंग-प्रत्यंगों का आलंकारिक शैली में चित्रण हुआ है।

३. पृथ्वीराज राठौड़ कृत वेलि : यह कृष्ण भक्ति वेलि साहित्य की अनुपम कृति है। मुगल दरबार में रहने वाले पृथ्वीराज राठौड़ ने ग्रन्थ के आरम्भ में महाकाव्य की परम्परा के अनुकूल मंगलाचरण किया है। तदनन्तर रुक्मिणी का वयःसन्धि चित्रण, रुक्मी द्वारा शिशुपाल को लगन भेजना, रुक्मिणी का दुःखी होकर कृष्ण को संदेश भेजना, नखसिख वर्णन युद्ध-प्रसंग, रुक्मिणी-हरण, षड ऋतु वर्णन और अन्त में वेलि के महात्मय का चित्रण किया गया है। कथावस्तु परम्परागत होते हुए भी यह एक उत्कृष्ट काव्य कृति बन पड़ी है।

४. साँयाजी झूला : इनकी दो महत्त्वपूर्ण कृतियां मिलती हैं। प्रथम रुक्मिणी हरण और द्वितीय नागदमण। पहले ग्रन्थ की कथावस्तु हरण घटना पर आधारित है जिसमें वेलि के समान ही कथा का विस्तार किया गया है। दूसरे ग्रन्थ "नाग दमण" में कवि ने कालिया नाग की विकरालता और नागयुद्ध व अन्त में नाग दमन की घटनाओं का विस्तार से वर्णन किया है। ये दोनों ग्रन्थ अत्यन्त ही रोचक और प्रभावशाली हैं।

५. माधोदास दधवाड़िया : ये जैतारण तहसील के वलून्दा ग्राम वासी थे। इन्होंने अनेक सुन्दर कृतियां लिखी हैं जिनमें से गजमोक्ष नामक काव्य ग्रन्थ कृष्ण लीला पर आधारित है। कवि ने कृष्ण द्वारा मगरमच्छ से हाथी की रक्षा का वर्णन परम्परागत ढंग से किया है और भगवान कृष्ण की अद्भुत करुण भावना का चित्रण किया है। इसकी कथावस्तु अत्यन्त अल्प होते हुए भी कृष्ण की वीर वेश धारी मूर्ति का सफल चित्रांकन किया गया है।

६. मुरारीदान बारहठ रचित विजय विवाह : इस ग्रन्थ का एक अन्य नाम गुणविजै ब्याह भी मिलता है। इसमें भी रुक्मिणी हरण सम्बन्धी कथा का विस्तार से चित्रण हुआ है। कवि ने इसमें कुन्दनपुर नगर का वर्णन विस्तार से किया है। तदनन्तर सारी कथा वेलि ग्रन्थों की भांति ही है। इसमें भी रुक्मिणी के नख-सिख सौन्दर्य एवम् कृष्ण के वीर वेश का चित्रण किया गया है।

७. रामनाथ कविया : इन्होंने द्रोपदी चीर हरण एवम् कृष्ण द्वारा द्रोपदी की रक्षा का प्रसंग चित्रित किया है। ७२ छन्दों की इस रचना का नाम इन्होंने "करुण बहत्तरी" अथवा "द्रोपदी विनय" दिया है। जब दुःशासन द्रोपदी के चीर का हरण करता है तो वह दीन हीन होकर कृष्ण को पुकारती है। यह करुण रस का बहुत ही सुन्दर काव्य बन पड़ा है।

८. सत्यप्रकाश जोशी : आधुनिक काल के कवि श्री जोशी ने अपने 'राधा' काव्य

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

में वियोग वर्णन का एक अनूठा स्वरूप चित्रित किया है। वियोगिनी राधा अपने प्रिय कृष्ण को बार बार वृन्दावन लौट आने का आग्रह करती है क्योंकि श्री कृष्ण कुरुक्षेत्र युद्ध के आयोजन में भाग लेने जाने वाले हैं राधा उन्हें रोकना चाहती है वह युद्ध की भयानकता का चित्रण करके वहां से लौट आने का आग्रह करती है। इस तरह द्वितीय युद्ध की पृष्ठभूमि में कवि ने युद्ध की भयानकता दिखाकर मानव जाति को युद्ध विभीषिका से बचाने की कामना की है।

अध्याय तृतीय : राजस्थानी के कृष्ण भक्त कवि

मुक्तक काव्य, स्फुट काव्य एवं लोकगीत

क. मुक्तक काव्य

स्वरूप विवेचन : बन्ध की दृष्टि से काव्य के दो प्रधान भेद माने गये हैं—प्रबन्ध और मुक्तक। मुक्तक काव्य में कथावस्तु का किसी प्रकार पूर्वापर सम्बन्ध नहीं होता, इसलिए प्रत्येक पद या दोहा अपने आप में स्वतन्त्र होता है। मुक्तक के भी कुछ विद्वानों ने दो भेद किये हैं—पाठ्य मुक्तक और गेय मुक्तक। पाठ्य मुक्तक में दोहा सोरठा जैसे छन्दों का प्रयोग किया जाता है जबकि गेय मुक्तक में गीत शैली का प्रयोग किया जाता है।

राजस्थानी मुक्तक काव्य परम्परा में दोनों ही प्रकार के मुक्तक मिलते हैं। ऐसे कवियों में ईसरदास, अल्लूजी कविया, दुरसा आढ़ा, परसुराम, नागरीदास, हरिचरणदास, कृपाराम आदि के नाम उल्लेखनीय हैं। कुछ स्त्री भक्त कवयित्रियां भी हुई है जिन्होंने स्वच्छन्द दोहे और सरस गीत लिखे हैं।

ख. प्रमुख कृष्ण भक्त मुक्तक काव्यकार

१. अल्लूजी कविया : ये जोधपुर के राजा मालदेव के समकालीन कवि थे। इन्होंने अनेक स्फुट रचनाएं लिखीं। इन्होंने कृष्ण भक्ति सम्बन्धी कुछ दोहे रचे जिनमें कृष्ण को गोपियों का चित्त हरने वाला, रास बिहारी, गोवर्धन धारक और जरासंध शिशुपाल को यमलोक पहुँचाने वाला बताया गया है। वे पृथ्वी का भार उतारने वाले सिद्ध किये गये हैं। उनके ये दोहे वीर रस प्रधान है और उनमें कृष्ण के व्यापक गुणों का चित्रण मिल जाता है। इनकी कृष्ण भक्ति सम्बन्धी प्रमुख रचना "कृष्णावतार" है जिनमें कृष्ण की विविध लीलाओं का व्यापक चित्रण मिल जाता है। इसमें कृष्ण की बाल लीलाओं से लेकर रास लीला, गजमोख चित्रण व गीता के प्रज्ञा पुरुष सिद्ध किये गये हैं।

२. भक्त कवि ईसरदास : ईसरदास का जन्म चारणों की बारहठ साखा में हुआ है। इनकी बीसियों रचनाएं मिलती है। जिनमें "हालां झालां री कुण्डलियां और "हरिरस" प्रमुख हैं। हरिरस में भगवान कृष्ण की व्यापक स्तुति की

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

गई है। इसमें कृष्ण को देवाधिदेव, त्रिगुण नाथ और पृथ्वी के उद्धारक सिद्ध किया गया है। इसमें भी कवि ने वीररस को प्रमुखता दी है। यह एक ओज गुण प्रधान रचना है।

३. खिड़िया कृपाराम : कवि का जन्म मारवाड़ के परबतसर परगने के खराड़ी नामक गाँव के चारण जगरामजी के यहाँ हुआ था। ये अपने गुणों के बल पर सीकर दरबार में सम्मानित राजपुरुष बने। इन्होंने अपने नौकर राजिया दरोगा को सम्बोधित कर १६५ दोहे लिखे थे, जिससे इन्हें जनकवि के रूप में ख्याति मिली। इन्होंने गो-वर्धन धार नामक कृष्ण भक्ति प्रधान खंड काव्य लिखा। इसमें कृष्ण की गोवर्धन लीला से सम्बन्धित रोचक वर्णन मिलता है।

४. जग्गाजी खिड़िया : इन्होंने राठौड़ रतनसिंह री वचनिका नामक एक बहुत ही रोचक और ऐतिहासिक काव्य-ग्रन्थ लिखा जिसका सम्पादन डॉ. एल.पी. टेसीटरी ने किया था। इन्होंने अन्य वीररस के कवियों की भांति कृष्ण भक्ति सम्बन्धी कुछ फुटकर छप्पय और दोहे लिखे हैं। जिनमें द्रोपदी चीर हरण और कृष्ण की अन्य छुट-पुट लीलाओं का चित्रण है।

५. भक्त कवि अमृतरामजी पालीवाल : ये जयपुर के राजा सवाई प्रतापसिंह के शासन काल में हुए हैं। इन्होंने कृष्ण लीलाओं से सम्बन्धित अनेक सरस वर्णन प्रस्तुत किये हैं। वे उस जमाने में इतने लोकप्रिय हुए थे कि गली-गली कृष्ण राधा पर लिखे गये पद लोगों के द्वारा गाये जाने लगे। इन पदों में राधा कृष्ण की अठखेलियाँ, होली हुड़दंग, रास विहार, नौका विहार और रास लीलाओं का वर्णन मिलता है। ये पद विभिन्न राग रागनियों में लिखे गये थे, इसलिये गेय माने जाते हैं।

६. मनोहर शर्मा : इनका जन्म शेखावटी के बिसाउ नामक गांव में हुआ। ये राजस्थानी भाषा और साहित्य के अधिकारी विद्वान समझे जाते हैं। इन्होंने राजस्थानी साहित्य अकादमी द्वारा विशिष्ट साहित्यकार का सम्मान प्राप्त किया है। इनकी लगभग ३० पुस्तकें प्रकाशित हो चुकी हैं, जिनमें से "गोपी-गीत" प्रमुख है। यह सूर के भ्रमर-गीत पर आधारित एक मधुर गीत-काव्य है, जिसमें गोपियों की विरहावस्था का मार्मिक चित्रण किया गया है। उद्धव द्वारा निर्गुण भक्ति की प्रतिष्ठा और गोपियों द्वारा उसका खण्डन तर्क-पूर्ण शैली में किया गया है। यह आधुनिक राजस्थानी साहित्य का एक सर्वश्रेष्ठ गीति काव्य है।

ग. राजस्थानी कृष्णभक्त स्त्री कवयित्रियाँ

कृष्ण-भक्ति साहित्य के विकास में स्त्री कवयित्रियों का योगदान भी अपूर्व रहा है। इन्होंने पुरुष भक्तों की भांति कृष्ण लीलाओं का गुणानुवाद किया है। इन प्रमुख कवयित्रियों में मरुधर मन्दाकिनी मीरा, चन्द सखी, रानी बॉकांवती, गिरिराज कुँवरी सुन्दर कुंवरी बाई, सौभाग्य कुँवरी, आनन्दी देवी आदि प्रमुख है।

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

१. मीरां बाई : मीरां बाई न केवल राजस्थानी साहित्य की सर्व श्रेष्ठ कवयित्री है अपितु मध्यकाल के भक्ति साहित्य की यह एक मात्र कवयित्री मानी जाती है। मीरां का जन्म मेड़ता के निकट हुआ था। ये आरम्भ से ही कृष्ण भक्ति की ओर आकर्षित हुई। माँ के संस्कार और उसके बाद विवाह के उपरान्त पति की मृत्यु के कारण इनका रुझान बैरागी जीवन की ओर हो गया। मीरां ने दाम्पत्य भाव की कृष्ण भक्ति को अपने पदों में प्रश्रय दिया। इनके पदों में विरह की सूक्ष्म अन्तर्दशाओं, प्रकृति का उद्धीपन चित्रण, भक्त हृदय की टीस, प्रेम की पीर, लोक मर्यादाओं का विरोध और अजस्त्र भक्ति का भाव चित्रित हुआ है। मीरां की भाषा व्रज मिश्रित राजस्थानी रही है। इनकी मीरां पदावली के दर्जनों संस्करण निकल चुके हैं। ये सुदूर बंगाल से लेकर महाराष्ट्र तक लोकप्रिय रही है।

२. चन्द्र सखी : भक्ति काव्य में कई सम्प्रदायों का जन्म हुआ है, इनमें से सखी सम्प्रदाय भी एक था। इसके अन्तर्गत भक्त भगवान की अराधना सखीभाव से किया करते हैं। चन्द्रसखी उनमें से एक थी। कुछ इन्हें पुरुष स्वीकार करते हैं, किन्तु राजस्थान में इन्हें भक्त कवयित्री के रूप में प्रतिष्ठा मिली है। मान्यता यह भी है कि ग्राम्य जीवन में मीरां से भी अधिक चन्द्र सखी के भजन लोकप्रिय हैं। औरतें मीरां से भी अधिक चन्द्रसखी के भजन बड़े चाव से गाती है। इनके भजनों में व्रज, राजस्थानी, मालवी, निमाड़ी और पंजाबी के शब्द भी मिलते हैं। इनके पदों में बाल लीला और विरह वर्णन के विविध पद मिलते हैं, साथ ही विनय और आसक्ति के पदों की प्रधानता भी है। इनकी भाषा में लालित्य, अलंकारों की स्वाभाविक छटा और रस का निर्बाध प्रवाह मिलता है।

अन्य स्त्री भक्त कवयित्रियों में सोढी नाथी, मीरां, रानी बांकावतीजी, गिरीराज कुँवरी, व्रजभान किशोरी, सौभाग्य कुँवरी, बाघेली रणछोड़ कुँवरी, रसिक बिहारी बनीठनी, अजब कुँवरी बाई आदि उल्लेखनीय नाम हैं। इन्होंने मीरा का अनुगमन करते हुए सैकड़ों पद रचे हैं।

राजस्थानी कृष्ण भक्ति साहित्य असीम कहा जा सकता है। दसवीं शताब्दी से लेकर आज तक सैकड़ों हजारों कृष्ण भक्त कवि हो चुके हैं, जिनमें फुटकर और गौण कवियों का भी स्थान कम महत्त्वपूर्ण नहीं है। इन कवियों में जैन, जैनेतर चारण और लौकिक कवि सभी आ जाते हैं। इन कवियों द्वारा रचित कृष्ण लोलाएं अनेक श्रेणियों में आबद्ध की जा सकती है। जिनमें वेलि काव्य, हरण काव्य, चरित काव्य, रास रासो, फागुन और सैकड़ों तरह के पद गीत भजन एवं गेय रचनायें मिलती हैं।

घ. राजस्थानी लोकगीतों में श्री कृष्ण

राजस्थान के लोक साहित्य में कृष्ण का चरित्र व्यापक रूप से चित्रित किया गया

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

है। इनमें से लोकगीतों की लोकप्रियता कुछ अधिक ही है। लोकगीत हमारी संस्कृति के सच्चे पहरेदार माने जाते हैं। इनमें हमारे लोकजीवन की भव्य और दिव्य झांकी मिलती है।

१. राजस्थानी लोकगीतों में कृष्ण चरित्र : हमारे लोकगीतों में कृष्ण की बाल-लीलाओं, नाग-दमण, माखन-चोरी, गौ चारण, रास लीला, मथुरा गमन आदि की घटनाओं का चित्रांकन मिल जाता है। ये लोकगीत प्राय: ग्राम्य जीवन में प्रात: उठने से लेकर रात्रि तक गाये जाते हैं। इन गीतों में गोकुल राजस्थानी के गांव की तरह ही अंकित किया गया है और राधा कृष्ण ग्रामीण युवती व युवक के रूप में अभिव्यन्जित है। इन गीतों में राधा कृष्ण की प्रेम क्रीड़ाओं का बड़ा ही हृदयस्पर्शी वर्णन मिलता है।

२. राजस्थानी लोकगीतों में कृष्ण एवम् अन्य पात्र : इन लोक गीतों में श्री कृष्ण के साथ बलराम, नन्द, नारद, सुदामा, कंस, शिशुपाल, जरासन्ध आदि का चित्रण भी मिलता है। इसके अलावा रूक्मिणी, सखी चन्द्रावली, यशोदा, गोपियों, कुब्जा आदि स्त्री पात्रों का समावेश भी हो गया है। माता यशोदा के वात्सल्य और कृष्ण के बाल हठ का बड़ा ही रोचक चित्रण मिलता है। हमारे ये लोकगीत ग्रामीण जीवन के खान-पान, रहन-सहन, वस्त्राभूषण और अन्तरंग जीवन की झाँकी चित्रित करते हैं।

चतुर्थ अध्याय : राजस्थानी कृष्ण भक्ति काव्य-भाव सौन्दर्य

कृष्ण भक्ति साहित्य भारतीय वाङ्गमय की अभूतपूर्व थाती है। युग युगान्तर से कृष्ण की लीलाएँ सहृदय कवियों को आकृष्ट करती रही हैं। संस्कृत साहित्य से लेकर पालि, प्राकृत एवम् अपभ्रंश काव्यों तक अनेक महाकाव्य, नाटक एवम् मुक्तक लिखे जा चुके हैं। इन काव्य ग्रन्थों का भाव सौष्ठव एवं कला सौन्दर्य भी अनूठा रहा है।

कृष्ण का चरित्र स्वयं ही विविध आयामी रहा है। उनकी बाल सुलभ क्रीड़ाओं, लोक रक्षक एवम् युवा प्रेमी रूप का सैकड़ों-हजारों वर्षों से गुणगान होता आ रहा है। कवियों ने अपने विभिन्न महाकाव्यों और मुक्तकों में प्रकृति चित्रण, वस्तु वर्णन विविध भावों की मनोहारी व्यंजना और भाषा की सजीवता, उत्कट अंलकार योजना व शैली विधान का पूरा ध्यान रखा है।

क. कथावस्तु

राजस्थानी कृष्ण काव्यों की कथावस्तु भागवत विष्णु पुराण, हरिवंश पुराण आदि पर आधारित है। इनसे कृष्ण की विविध लीलाओं हेतु प्रेरणा ग्रहण की गई है। डिंगल काव्यों में कृष्ण की जीवन घटनाओं का कुछ विशेष परिवेश में चित्रण हुआ है। चारण कवियों ने मुगलों रूपी असुरों का नाश करने के

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

लिए अपने आश्रय दाता राजाओं को श्री कृष्ण के रूप में चित्रित कर दिया है। जैसा कि नागदमण के रचयिता सांयाजी झूला कहते हैं :

अवनी भार उतारवा जाग्यो एणा जुगत्ति ।
नाथ विहाणे नित नवे नवै बिराणै नत्रि ॥"

वेलि काव्यों में जिन घटनाओं का वर्णन है वह भी चारण कवियों के वीर भाव को अभिव्यंजित करता है। इनमें कुछ चमत्कारिक घटनाओं का वर्णन भी कर दिया गया है। आधुनिक कवि सत्यप्रकाश जोशी ने अपने 'राधा' काव्य की कथावस्तु में युगानुबोध युद्ध विरोधी भाव व्यक्त किये हैं। मुक्तक काव्यों में किसी एक क्रमबद्ध कथानक का अभाव है। लेकिन कृष्ण के उद्धारक रूप का विविध प्रसंगों के द्वारा उल्लेख करके विभिन्न पदों, दोहों और सवैयों का निर्माण किया गया है। मीरा, चन्द्रसखी और अन्य स्त्री कवयित्रियों ने अपनी विरह वेदना को ही विषय वस्तु का आधार बनाया है।

ख. चरित्र चित्रण

कृष्ण भक्त कवियों ने श्री कृष्ण और रुक्मिणी का चरित्र पुराण सम्मत ही चित्रित किया है। किन्तु चारण कवियों ने कृष्ण के रूप में वीर राजपूतों की शूरवीरता और मुगल असुर रूपी आततताइयों के विनाशक ही सिद्ध किया है। अन्य पात्रों का चरित्र भी परम्परा अनुकूल है। रुक्मिणी आभिजात्य नायिका सिद्ध की गई है। रुक्म और शिशुपाल प्रतिनायक के रूप में प्रकट किये गये है। पृथ्वीराज राठौड़, सायांजी झूला और मुरारीदान बारहठ आदि ने पात्रों का तत्कालीन राजनैतिक परिस्थितियों के रूप में चित्रण किया है।

ग. वस्तु वर्णन

प्रबन्ध काव्य की गरिमा के अनुकूल सभी कवियों ने युद्ध वर्णन, नगर वर्णन, स्वागत वर्णन और राज्य सभा का वर्णन बढ़ चढ़कर किया है। इन वर्णनों में सामन्ती वातावरण और राज्योचित गरिमा का विशेष वर्णन कर दिया है।

घ. रस विवेचन

चारण कवियों ने वीर रस का विशेष निरूपण किया है, किन्तु कृष्ण-रुक्मिणी विवाह प्रसंग के माध्यम से श्रृंगार रस का विस्तृत वर्णन भी हुआ है। करमसी सांखला, पृथ्वीराज राठौड़ ने रुक्मणी की वयःसन्धि अवस्था और उनके नखसिख सौन्दर्य का बड़ा ही चमत्कारिक वर्णन किया है। ये सभी कवि भक्त थे इसलिए शान्त रस का निरूपण भी हो गया है। मुक्तक काव्यकारों ने ईश्वर के भक्त वत्सल रूप और उनके दुष्ट दलन रूप की ही मीमांसा की है। इन्होंने अपने दोहों और पदों में ईश्वर का गुणानुवाद करते हुए शान्त रस की अनुभूति करा दी है। मीरांबाई, ईसर दास, मनोहर शर्मा आदि के काव्य में सगुण-भक्ति के

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

व्यापक दर्शन हो जाते हैं।

ङ. प्रकृति वर्णन

प्रबन्धात्मक कृष्ण काव्यों में षड् ऋतु वर्णन की परम्परा का निर्वाह हुआ है। श्री पृथ्वीराज राठौड़ ने अपनी वेलि में बसन्त ऋतु का जो रूपक बांधा है वह हृदयहारी है। उन्होने युद्ध वर्णन में भी वर्षा काल का रूपक प्रस्तुत कर दिया है। सायांजी झूला ने युद्ध क्षेत्र की भयानकता विभिन्न प्राकृतिक उपकरणों से व्यक्त की है। सत्यप्रकाश जोशी ने अपने 'राधा' काव्य में प्रकृति का आलम्बन उद्दीपन रूप बड़ी ही सूक्ष्मता से दर्शाया है। मीरां के काव्य में प्रकृति उपदेशात्मक रूप लिये हुए है।

च. राजस्थानी कृष्ण काव्य में लोक-जीवन का चित्रण

कृष्ण भक्त कवियों ने अपने काव्य में लोक जीवन की बड़ी ही गहन अभिव्यक्ति की है। कृषकों के क्रिया कलापों और खान-पान रहन-सहन, पर्व-त्यौहार आदि का व्यापक वर्णन हो गया है। लगभग सभी कवियों ने राजस्थानी वेश-भूषा और यहाँ के तीज त्यौहारों का मार्मिकता के साथ चित्रण किया है। विशेषकर मुक्तक काव्य में कवियों ने स्थानीय विशेषताओं को सोत्साह चित्रित किया है। सत्य प्रकाश जोशी, मनोहर शर्मा, मीरा बाई आदि ने लोक मर्यादाओं का भी कुशलता के साथ चित्रण किया है।

पंचम अध्याय राजस्थानी-कृष्ण-काव्य का कला पक्ष :

कृष्ण भक्त कवियों ने भाषा, छन्द, अलंकार और शैली विधान में भी अपनी कलात्मकता का परिचय दिया है।

क. भाषा

इन कवियों की भाषा प्रौढ़ डिंगल रही है। उसमें संस्कृत निष्ठ शब्दों के साथ-साथ लोक प्रचलित शब्दों का प्रयोग भी हुआ है। शब्द शक्तियों गुण और वाक्य गठन में इनकी प्रतिभा का परिचय मिल जाता है। पृथ्वीराज की भाषा परिमार्जित डिंगल है। सांयाजी और माधोदास आदि कवियों ने अपेक्षाकृत सरल शब्दावली का प्रयोग किया है। इनकी भाषा में अर्थ गौरव व चमत्कारिकता के दर्शन होते हैं। मीरा और अन्य स्त्री भक्त कवयित्रियों की भाषा में जन-प्रचलित शब्दावली का अधिक प्रयोग हुआ है।

ख. अलंकार योजना

कृष्ण भक्त कवियों ने राजस्थानी के प्रचलित वयरण सगाई अलंकार का भरपूर प्रयोग किया है। इसके अतिरिक्त यमक, श्लेष, उपमा, रूपक उत्प्रेक्षा, अतिशयोक्ति

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

सन्देह भ्रान्तियान का भी भरपूर उपयोग किया है।

ग. छन्द योजना

कवियों ने दोहा, सोरठा व छोटा साणौर झंपताल, निसाणी छन्दों का व्यापक प्रयोग किया है। पृथ्वीराज ने वेलियो गीत का बड़ी कुशलता से प्रयोग किया है जो राजस्थानी का लोकप्रिय छन्द है। इसके अतिरिक्त दोहा-सोरठा का प्रयोग ईसरदास, रामनाथ कविया आदि ने प्रयोग करके कृष्ण भक्ति साहित्य को प्रौढता प्रदान की है।

घ. काव्य रूप

कृष्ण भक्त काव्य प्रबन्ध और मुक्तक शैली में मिलता है। करमसी सांखला, पृथ्वीराज ने वेलि ग्रन्थों का प्रणयन प्रबन्ध शैली में किया है। माधोदास का गज मोख, सांयाजी का नागदमण व रुक्मिणी हरण खण्ड काव्य की शैली में लिखे हुए कहे जा सकते हैं। मुक्तक काव्यों में मीरा पदावली गीत शैली में है तो श्री मनोहर शर्मा व सत्य प्रकाश जोशी ने आधुनिक नवगीत का आभास करा दिया है। इस तरह शैली की दृष्टि से आलोच्य कवियों ने विविधता का परिचय दिया है।

षष्ठ अध्याय : उपसंहार

मध्यकालीन पौराणिक हिन्दी काव्य एवम्

राजस्थानी कृष्ण भक्ति साहित्य में मौलिक अन्तर

मध्यकालीन हिन्दी साहित्य का आधार पौराणिक काव्य एवम् संस्कृत का नाट्य काव्य साहित्य रहा है। मध्यकाल में मुस्लिम शासन के कारण हिन्दू धर्म पतन की ओर अग्रसर हो रहा था इसलिए हिन्दी एवम् राजस्थानी के कवियों ने धर्म और संस्कृति की रक्षार्थ धार्मिक और वीर भावना को बढ़ावा दिया। हिन्दी के कवियों ने तो मात्र कृष्ण के लोक रंजक रूप का ही चित्रण किया है, किन्तु राजस्थानी के कवियों ने उनके वीर वेश को ही चित्रित किया है। अवश्य मुक्तक काव्यकारों ने कृष्ण को दुष्टदलन और भक्त वत्सल रूप में देखा है, किन्तु प्रबन्धकारों ने तो कृष्ण लीलाओं की आड़ में मुगल असुरों के विनाश की ओर संकेत कर दिया है। सांयाजी जैसे कवियों ने नागदमण के माध्यम से गौ रक्षा और नारी सम्मान को अभिव्यन्जित कर दिया है।

समकालीन साहित्य पर प्रभाव

कृष्ण भक्त कवियों ने राजस्थानी के आधुनिक कवियों को भी प्रभावित किया है। मनोहर शर्मा के गोपी गीत में निर्गुण भक्ति पर सगुण भक्ति की विजय बतलाई

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

है। सत्यप्रकाश जोशी ने अपने राधा काव्य में आधुनिक युद्ध विरोधी भाव प्रकट कर दिये हैं। मीरां बाई से प्रभावित होकर चन्द्रसखी के काव्य में दाम्पत्य भाव की भक्ति प्रदर्शित की गई। अतः भाव और भाषा की दृष्टि से परवर्ती कृष्ण काव्य पूर्णतः प्रभावित हुआ है। इन काव्यों में चित्रित भक्ति भावना के कारण ये लोक कवि इतने लोकप्रिय हुए हैं कि इनको भी कृष्ण की तरह ही समादर प्राप्त हुआ है, यही इन कवियों की महान् उपलब्धि है।

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

नाटकलक्षणरत्नकोश का विवेचनात्मक अध्ययन

कुमारी यशोरानी गौड़

वर्ष १९८५ में पी-एच. डी. (संस्कृत) की उपाधि के लिए
जोधपुर विश्वविद्यालय द्वारा स्वीकृत शोध-प्रबन्ध का सारांश*

सागरनन्दीकृत "नाटकलक्षणरत्नकोश" नामक नाट्यशास्त्रीय ग्रन्थ पर यह शोध-कार्य किया गया है। सागरनन्दी का ग्रन्थ आचार्य भरत के "नाट्यशास्त्र" के आधार पर लिखा गया है। इस शोध-प्रबन्ध में विभिन्न नाट्य-तत्त्वों का क्रम सागरनन्दी द्वारा विवेचित क्रम के अनुसार न रखकर नाट्यशास्त्रीय क्रम में रखा गया है।

प्रस्तुत शोध-प्रबन्ध को दस अध्यायों में विभाजित किया गया है।

इसके प्रथम अध्याय में सागरनन्दी द्वारा "नाटकलक्षणरत्नकोश" में उद्धृत आचार्यों, सागरनन्दी से पूर्ववर्ती तथा परवर्ती नाट्यशास्त्रीय प्रमुख आचार्यों तथा सागरनन्दी के व्यक्तित्व एवं कृतित्व पर प्रकाश डालने का प्रयास किया गया है।

द्वितीय अध्याय में "कथावस्तु" का विवेचन किया गया है। सर्वप्रथम कथावस्तु के विभिन्न पर्यायवाची शब्दों यथा–वस्तु, आख्यान, इतिवृत्त, वृत्त, इतिहास, चरित इत्यादि के व्युत्पत्तिगत अर्थ को स्पष्ट किया गया है। नाट्य में कथावस्तु अतीतकालिक होनी चाहिए अथवा वर्तमानकालीन चरित को नाट्य कथावस्तु के रूप में ग्रहण करना चाहिए–इस सम्बन्ध में आचार्यों के भिन्न-भिन्न मतों का उल्लेख किया गया है। कथावस्तु की संरचना गोपुच्छाग्रवत् होनी चाहिए जिसमें जीवन की विभिन्न घटनाओं का संकलन किया जाना चाहिए। इसके पश्चात कथावस्तु के विभिन्न भेदों का विवेचन किया गया है।

तृतीय अध्याय में बीज, बिन्दु इत्यादि पांच अर्थप्रकृतियों, आरम्भ, प्रयत्न इत्यादि पांच अवस्थाओं, मुख, प्रतिमुख इत्यादि पांच सन्धियों तथा सन्ध्यंगों का विवेचन किया गया है। सागरनन्दी ने इन सभी तत्त्वों का सोदाहरण विवेचन किया है तथा पांचों अवस्थाओं व पांचों सन्धियों के लक्षण को प्रस्तुत करते हुए मातृगुप्ताचार्य के मत को भी प्रस्तुत किया है।

---

*यह शोध डा. (श्रीमती) प्रीतिप्रभा गोयल, सह आचार्य, संस्कृत विभाग, जोधपुर विश्वविद्यालय, जोधपुर के निर्देशन में किया गया।

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

चतूर्थ अध्याय में नाटक के फल का एकमात्र उपभोग करने वाले पात्र नायक तथा नायिका का विवेचन किया गया है। नायक विवेचन के अन्तर्गत नायक के सात्त्विक गुण, भेद तथा नायक के सहायक पात्रों का वर्णन किया गया है। नायिका विवेचन करते हुए नायिकाओं के गुण तथा चेष्टालंकार, नायिका-यौवन की अवस्थाओं, नायिकाओं का मान, स्मरदशाओं तथा विभिन्न भेदों इत्यादि का विवेचन किया गया है।

पंचम अध्याय में वृत्तिलक्षण, वृत्तियों का उद्भव, भारती, सात्वती, कैशिकी तथा आरभटी–इन चतुर्विध वृत्तियों, आंगिक, वाचिक सात्विक और आहार्य–इन चतुर्विध अभिनयों तथा इनके अतिरिक्त वाक्याभिनय, सूचाभिनय इत्यादि अन्य पांच प्रकार के अभिनयों का भी विवेचन किया गया है।

षष्ठ अध्याय के अन्तर्गत स्थायी भाव, विभाव, अनुभाव, व्यभिचारीभाव इत्यादि विभिन्न प्रकार के भावों व उनके भेदों का वर्णन किया गया है तथा रस-विवेचन करते हुए रस का स्वरूप, रसनिष्पत्ति, रस का आश्रय तथा शृंगार इत्यादि आठ प्रकार के रसों का विवेचन किया गया है। शान्त रस का सागरनन्दी ने कोई उल्लेख नहीं किया है; अतः सागरनन्दी द्वारा मान्य नहीं होने के कारण प्रस्तुत शोध-प्रबन्ध में शान्तरस का वर्णन नहीं किया गया है।

सप्तम अध्याय में नाट्य का लक्षण, नाट्य के पर्याय, नाट्य के भेदक तत्त्व तथा नाटक, प्रकरण इत्यादि दस रसात्मक रूपकों का निरूपण किया गया है। सागरनन्दी ने इन रूपकभेदों के उदाहरण देते हुए अनेक ऐसे ग्रन्थों का नामोल्लेख किया है जो वर्तमान समय में उपलब्ध नहीं होते।

अष्टम अध्याय में उपरूपक का पूर्व-इतिहास तथा सागरनन्दी द्वारा वर्णित नाटिका इत्यादि सत्रह उपरूपकों का विवेचन किया गया है। सागरनन्दी ने इन उपरूपकों के उदाहरण के रूप में भी अनेक ऐसी रचनाओं का उल्लेख किया है जो अद्यावधि उपलब्ध नहीं है।

नवम अध्याय में पूर्व अध्यायों में अनालोचित, अविवेचित कतिपय महत्त्वपूर्ण नाट्योपकारक तत्त्वों यथा पूर्वरंग, नाट्यप्रवृत्तियां, भाषा विधान, सम्बोधन विधियां, पात्रों का नाम विधान, सन्ध्यंतर नाट्यालंकार तथा नाट्यलक्षण इत्यादि का विवेचन वर्णित है। सागरनन्दी ने सन्ध्यन्तरों, नाट्यालंकारों तथा नाट्यलक्षणों आदि के सम्पूर्ण भेदों को उदाहरण प्रस्तुत करके स्पष्ट किया है।

दशम अध्याय उपसंहारात्मक है जिसके अन्तर्गत विभिन्न अध्यायों के सारांश तथा निष्कर्ष को प्रस्तुत किया गया है।

सागरनन्दीकृत ''नाटकलक्षणरत्नकोश'' नामक ग्रन्थ के वर्णनात्मक, विश्लेषणात्मक एवं विवेचनात्मक अध्ययन से जो निष्कर्ष प्राप्त हुए एवं प्रस्तुत शोध-प्रबन्ध की जो मौलिकता रही है. उसे संक्षेप में निम्नलिखित रूप में प्रस्तुत किया जा सकता है :

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

सागरनन्दी द्वारा किए गए कथावस्तु विवेचन से यही स्पष्ट होता है कि यद्यपि कथावस्तु के विवेचन में सागरनन्दी ने अपनी पूर्व-परम्परा का ही अनुसरण किया है तथापि इसके स्वरूप का विवेचन करते हुए उन्होंने वर्तमात चरित को भी नाट्य की कथावस्तु के रूप में ग्रहण किये जाने का अपना मौलिक मत भी प्रस्तुत किया है। प्रायः समस्त नाट्यशास्त्रीय आचार्यों ने अतीतकालिक कथा-वस्तु को ही नाट्य–कथावस्तु के रूप में निबद्ध किए जाने का विधान किया है। इस प्रकार नाट्यशास्त्रकारों की विभिन्न विचार धाराओं का नाटकों-लक्ष्यग्रन्थों की कसौटी पर परीक्षण किए जाने पर यही निष्कर्ष प्राप्त हुआ कि किसी भी नाटक में वर्तमान-चरित नाटक की कथावस्तु के रुप में उपलब्ध नहीं होता। कथावस्तु के उपात्त-प्रतिसंस्कृत इत्यादि भेदों के विवेचन में भी सागरनन्दी ने अपनी मौलिकता को अंकित कर दिया है।

अर्थप्रकृति, अवस्था व सन्धि विवेचन में भी सागरनन्दी प्रमुखतः आचार्य भरत से प्रभावित रहे हैं। यद्यपि सागरनन्दी ने प्रत्येक अर्थप्रकृति तथा प्रत्येक अवस्था का उदाहरण प्रस्तुत नहीं किया है तथापि प्रस्तुत शोध-प्रबन्ध में अर्थ-प्रकृतियों तथा अवस्थाओं को यथा सम्भव लोक-प्रचलित नाटक–नाटिकाओं से उदाहरण देकर स्पष्ट करने का प्रयास किया गया है। सागरनन्दी ने बीजवपन अथवा बीज को निर्देशित करने के श्लेष, छाया और उपक्षेप आदि जिन तीन प्रकारों का उल्लेख किया है, परोक्षतया उनको प्रस्तावना के विभिन्न अंगों से जोड़ना व साम्य प्रदर्शित करना प्रस्तुत शोध-प्रबन्ध की मौलिकता है। सागर-नन्दी ने सान्ध्यंगो के प्रयोजनों का भी उल्लेख नहीं किया है लेकिन अन्य समस्त नाट्यशास्त्रीय आचार्यों द्वारा विवेचित होने के कारण प्रस्तुत शोध-प्रबन्ध में इनका भी अत्यन्त संक्षेप में वर्णन किया गया है।

सागरनन्दी ने नायक तथा नायिका के समस्त भेदों का निरूपण नहीं किया है तथापि इस प्रबन्ध में नाट्यपरम्परा के अनुसार इनका संक्षिप्त विवेचन प्रस्तुत किया गया है। सागरनन्दी ने नायक की अपेक्षा नायिका का अत्यधिक विस्तृत विवेचन किया है। भरत इत्यादि आचार्यों ने जो शोभा, कान्ति, दीप्ति इत्यादि सात अयत्नज अलंकार माने, सागरनन्दी ने उन्हें गुण रूप में स्वीकार कर अपनी मौलिकता को प्रतिपादित किया है। वस्तुतः इन शोभा, दीप्ति, औदार्य, प्रगल्-भता इत्यादि अलंकारों को गुण रुप में स्वीकार करने का सागरनन्दी का मत उचित है, इसका युक्तियुक्त विवेचन करना प्रस्तुत शोध-प्रबन्ध की मौलिकता है। इसी प्रकार नायिकाओं के मुग्ध, मनाड्.मुग्ध इत्यादि चार प्रकार के मान के विवेचन से भी सागरनन्दी की विलक्षण प्रतिभा का परिचय प्राप्त होता है।

सागरनन्दी द्वारा किया गया भारती, सात्वती इत्यादि चतुर्विध वृत्तियों का विवेचन अपनी पूर्व-परम्परानुसार है। अभिनय विवेचन में यद्यपि सागर-नन्दी ने वाचिक, आंगिक इत्यादि चतुर्विध अभिनयों का नामोल्लेख मात्र ही किया है लेकिन अभिनय नाट्य का मूल तत्त्व होता है; अतः अन्य आचार्यों के अनुसार

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

इन चतुर्विध अभिनयों का इस शोध-प्रबन्ध में संक्षिप्त विवेचन किया गया है। सागरनन्दी ने जो वाक्याभिनय, सूचाभिनय इत्यादि पांच प्रकार के अभिनयों का निरूपण किया है, यह निरूपण समस्त आचार्यों से पृथक् होने के कारण सागरनन्दी की मौलिक उद्भावना है।

भाव विवेचन में सागरनन्दी ने स्थायी भावों को परिभाषित करने के पश्चात् रति, हास इत्यादि आठ प्रकार के स्थायी भावों का नामोल्लेख मात्र ही किया, उनका विवेचन नहीं किया है। लेकिन भावों में सर्वाधिक महत्वपूर्ण होने के कारण सागरनन्दी द्वारा विवेचित न होने पर भी प्रस्तुत शोध-प्रबन्ध में आचार्य भरत के अनुसार इनका वर्णन किया गया है। अनुभाव को किन्हीं आचार्यों ने कारण माना है तथा किन्हीं ने कार्य। विभिन्न दृष्टियों से अवलोकन किये जाने पर, अनुभाव कारण रूप है अथवा कार्य रूप–ये दोनों ही कथन उपयुक्त प्रतीत होते हैं। यथा लौकिक जगत् में मनुष्य के हृदय में रत्यादि जागृत होने के पश्चात् रोमांच कटाक्ष आदि अनुभाव प्रकट होते है; अतः ये भाव के कार्य रूप हैं, किन्तु काव्य तथा सामाजिक दृष्टि से ये अनुभाव कारण रूप ही हैं। रामादि पात्र के हृदय में जागृत शोकादि भावों को प्रकट करने वाले रुदन, मूर्च्छा, प्रलाप आदि अनुभाव सामाजिक के रसोन्मेष के कारण बन जाया करते हैं।

रस के स्वरूप विवेचन में सागरनन्दी ने शृंगार, करुण तथा हास्य को मृदु रस, रौद्र, वीभत्स व भयानक को दीप्त रस तथा वीर व अद्भुत को मध्यम रस के रूप में स्वीकार कर अन्याचार्यों से सर्वथा भिन्न अपने मौलिक मत को प्रस्थापित किया है। काव्य अथवा नाट्य में रस का प्रयोग सीमाबद्ध ही होना चाहिए। रसोन्मेष के अतिरेक से कथावस्तु के प्रवाह में निश्चयेन बाधा पड़ती है, इसे प्रस्तुत शोध-प्रबन्ध में उदाहरण पूर्वक स्पष्ट किया गया है।

सागरनन्दी ने दर्शकों के सम्मुख पूर्वरंग का सांगोपांग निर्वाह करने रूप आचार्य भरत के मत का खण्डन किया है। वस्तुतः सागरनन्दी द्वारा किया गया यह खण्डन उचित ही प्रतीत होता है क्योंकि नाट्य प्रयोग के पूर्व पूर्वरंग का अत्याधिक विस्तृत प्रयोग दर्शकों को उबाने वाला ही होता है।

सागरनन्दी द्वारा किया गया रूपक अथवा नाट्यभेदों का विवेचन अपनी पूर्व परम्परानुसार ही है। रूपक भेदों में तथा भारती वृत्ति के विभिन्न भेदों में प्रहसन और वीथी ये दो नाम समान हैं। अर्थात् प्रहसन तथा वीथी रुपक प्रकार भी हैं एवं भारती वृत्ति के चार अंगों में भी परिगणित हैं। आपाततः ये दोनों भिन्न-भिन्न वर्णित होने चाहिए थे, किन्तु सभी नाट्यशास्त्रकारों ने रूपक भेद प्रहसन और वीथी तथा भारती वृत्ति के अंग रूप प्रहसन और वीथी को एक कहकर छोड़ दिया है। सागरनन्दी भी इसके अपवाद नहीं हैं। रूपक भेद प्रहसन और वीथी तथा भारती वृत्ति के अंग रूप प्रहसन और वीथी को पारस्परिक भिन्नता को प्रदर्शित करना प्रस्तुत शोध-प्रबन्ध की मौलिकता है।

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

पूर्वरंग, नाट्य प्रवृत्तियां, भाषा विधान, सम्बोधन विधि इत्यादि के सम्बंध में सागरनन्दी के विचार पूर्व परम्परानुसार तथा सर्वमान्य हैं। सन्ध्यन्तर विवेचना में इक्कीस प्रकार के सन्ध्यन्तरों की परिभाषा व उदाहरण सहित विवेचना करना सागरनन्दी की विशेषता रही है। इसी प्रकार इन्होंने नाट्यालंकार तथा नाट्यलक्षणों का भी सोदाहरण निरूपण किया है।

अन्ततः "नाटकलक्षणरत्नकोश" नामक ग्रन्थ का सम्यक् अध्ययन करके विभिन्न नाट्य तत्त्वों का सन्दर्भयुक्त प्रामाणिक विवेचन करना ही प्रस्तुत शोध-प्रबन्ध की प्रमुख विशेषता रही है। सुधीजन इस शोध-कार्य से सन्तोष प्राप्त कर सकेंगे, इसी हेतु यह परिश्रम है।

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

राजस्थानी साहित्य में महिलाओं का योगदान

श्रीमती चैनकंवर शेखावत

वर्ष १९८५ में पी-एच.डी. (राजस्थानी) की उपाधि के लिए
जोधपुर विश्वविद्यालय द्वारा स्वीकृत शोध-प्रबन्ध का सारांश*

राजस्थानी भाषा अत्यन्त प्राचीन एवं समृद्ध भाषा है। विक्रम की ९वीं शताब्दी से लेकर अब तक लगभग १२०० वर्षों का इसका विविध एवं विशाल साहित्य उपलब्ध है। मौखिक एवं लिखित दोनों ही परम्पराओं से युक्त विविध विधाओं का साहित्य अन्य आधुनिक भारतीय भाषाओं से किसी प्रकार भी अल्प नहीं है।

राजस्थानी साहित्य की इस साहित्य परम्परा को समृद्ध करने में यहां की महिला साहित्यकारों ने भी महत्त्वपूर्ण योगदान दिया है। मध्यावधि राजस्थानी साहित्य के इतिहास में महिलाओं के योगदान पर प्रकाश नहीं डाला जा सका और एक अभाव सदा खटकता रहा, इसलिए मैंने इस शोध-प्रबन्ध के प्रस्तुतीकरण की आवश्यकता अनुभव की। मेरी यह मान्यता रही है कि जिस प्रकार राजस्थान की महिलाओं के योगदान का मूल्यांकन किये बिना सम्पूर्ण भारत का इतिहास अधूरा है, उसी प्रकार राजस्थानी महिला साहित्यकारों के योगदान का समयक अध्ययन किये बिना राजस्थानी साहित्य अपूर्ण है। इसलिए मैंने अपने अनुसंधान का विषय "राजस्थानी साहित्य में महिलाओं का योगदान" शीर्षक रखा और उसके अनुसंधान से यह सिद्ध करने का प्रयास किया है कि अब तक अनेक महिला साहित्यकारों की रचनाओं की उपेक्षा हुई है। मैंने अपने अनुसंधान का निम्नलिखित ९ अध्यायों में विभाजन किया और सोदाहरण उनका प्रस्तुतीकरण किया हैं, जो निम्नानुसार है।

प्रथम अध्याय

प्रथम अध्याय को चार भागों में बांटा गया है। प्रथम अध्याय राजस्थानी भाषा एवं साहित्य के परिचय से सम्बन्ध रखता है, द्वितीय में इस विषय सम्बन्धी अब तक हुए कार्य का विवरण, तृतीय में अध्ययन की रूपरेखा, क्षेत्र तथा सीमाएँ, तथा चतुर्थ में शोध-प्रबन्ध का उद्देश्य आदि चार भागों में विभाजित किया है।

पृष्ठभूमि के रूप में वैदिक काल की कवयित्रियों का संक्षिप्त वर्णन किया

*यह शोध-प्रबन्ध डॉ. कल्याणसिंह शेखावत, सह आचार्य एवं विभागाध्यक्ष, राजस्थानी विभाग, जोधपुर विश्वविद्यालय, जोधपुर के निर्देशन में किया गया।

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

गया है। वैदिक काल की कवयित्रियों ने अपने सुमधुर काव्य तथा साहित्य का सृजन कर अतुलनीय योगदान किया है। राजस्थानी भाषा की उत्पत्ति नवीं शताब्दी से मानी गई है। इस भाषा की उत्पत्ति शौरसेनी, नागर अथवा मरु-गुजरी अपभ्रंश से हुई है। अपभ्रंश की अन्तिम अवस्था ही राजस्थानी का प्रारम्भिक काल माना जाता है। राजस्थानी भाषा का प्राचीन नाम मरु भाषा था। सर्व प्रथम यह नाम उद्योतन सूरी के प्रसिद्ध ग्रन्थ "कुवलमाला" में मिलता है।

द्वितीय अध्याय

यह अध्याय कवयित्रियों के वर्गीकरण से सम्बन्धित है। भारत के विगत इतिहास का अगर हम सिंहावलोकन करें तो हमें ज्ञात होगा कि भारत के राजनैतिक और सामाजिक जीवन में अनेक उतार चढ़ाव आये हैं। इन उतार चढ़ावों का तत्कालीन समाज ने किस रूप में सामना किया, उसका निश्चित काल क्रमानुसार इतिवृत्त इतिहास में मिलता है, तथा जनमानस के हृदयस्थ भाव उस युग के साहित्य में प्रतिबिम्बित होते दिखाई देते हैं। साहित्य और समाज का अन्योन्याश्रित सम्बन्ध है। जैसी समाज की भावनाएँ होंगी वैसा ही साहित्य हमारे सामने आयेगा। इस प्रकार भारत जैसे विशाल राष्ट्र में जब जब वीर, भक्ति, वैराग्य, श्रृंगार की भावनाओं का आविर्भाव हुआ तब तब वहां के साहित्य के सृजकों ने समाज की भावनाओं के अनुरूप साहित्य सृजन किया। राजस्थान की विदुषी कवयित्रियों के समस्त साहित्य का भावानुरूप वर्गीकरण इस प्रकार किया गया है :

(अ) डिंगल काव्य धारा की कवयित्रियां
(ब) राम काव्य धारा की कवयित्रियां
(स) कृष्ण काव्य धारा की कवयित्रियां
(द) निर्गुण काव्य धारा की कवयित्रियां एवं अन्य कवयित्रियां

तृतीय अध्याय

यह डिंगल काव्य धारा की कवयित्रियों से सम्बन्ध रखता है। डिंगल काव्य धारा के अन्तर्गत उन कवयित्रियों का अध्ययन किया गया है, जिनकी भाषा डिंगल है, भाव अधिकांश रूप से वीर रस परिपूर्ण और छंद विधान डिंगल कवियों का सा है। इस काल की कवयित्रियां विशेष रूप से राजघराने या राजाओं के आश्रित चारणों से सम्बन्धित हैं। तत्कालीन रानियों एवम् चारण कवयित्रियों ने साहित्यानुरागी राजाओं की साहित्य साधना में एक ओर सहायता प्रदान की, उद्बोधन दिया तो दूसरी ओर उसके संयोग-वियोग में उठने वाली भावनाओं को वाणी प्रदान की। इस प्रकार डिंगल काव्य धारा की कवयित्रियों में वीर रस और श्रृंगार रस का एक साथ सुखद चित्रण दिखाई देता है।

जिस प्रकार चारण कवियों ने रणांगण में रण बांकुरे राजपूतों को युद्ध के

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

लिए उत्साहित कर उनमें वीरोचित भावनाएं भरीं, ठीक उसी तरह से डिंगल कवयित्रियों ने घर में बैठकर सोये सिंहों को अपनी विस्मृत शक्ति का स्मरण कराया और वीर माता, बहन एवम् पत्नी के रूप में उद्बोधन देकर अपने कर्त्तव्य के प्रति जागरूक किया। जो कार्य डिंगल कवियों ने युद्ध भूमि में किया, वही कार्य इन डिंगल कवयित्रियों ने सामाजिक परिस्थितियों का सामना करते हुए घर में बैठ कर किया।

इस प्रकार ओज और युद्ध के वातावरण में डिंगल कवयित्रियों के स्वर एक ओर वीर रस से परिपूर्ण सुनाई पड़ते हैं तो दूसरी ओर भक्ति एवम् श्रृंगार रस से परिपूर्ण सुनाई पड़ते हैं।

चतुर्थ अध्याय

यह अध्याय राम काव्य धारा की कवयित्रियों से सम्बन्धित है। निरन्तर युद्ध के पश्चात् भारतीय जन मानस में भक्ति भाव की लहरें तरंगित होने लगी। युद्ध से त्रस्त मानव राम और कृष्ण की शरण में जाने लगे। भगवान के विभिन्न अवतारों तथा राम-कृष्ण को लेकर तत्कालीन आचार्य विभिन्न सम्प्रदायों की कल्पना करने लगे और अपने-अपने आराध्य देव की महिमा के गुणगान का श्री गणेश हुआ। इस दृष्टि से रामानन्द के सिद्धान्तों को हृदयगम करके मर्यादा पुरुषोत्तम राम की भाव भरी गाथाएं रामायण, रामचरित मानस, विनय पत्रिका, कवितावली, जानकी मंगल आदि ग्रंथों के सदृश्य राम भक्ति धारा की कवयित्रियों ने भी अनेक ग्रंथों की रचना की। प्रताप कंवरि ने १५ ग्रंथों की रचना की। इनके ग्रंथों में राम के विविध रूपों व चरित्रों को बताया गया है।

इस काव्य धारा को घर-घर पहुंचाने का श्रेय कवयित्री प्रताप कंवरि को है। इनके पश्चात् तो अनेक कवयित्रियों के ग्रंथ उपलब्ध होते हैं। इन कवयित्रियों की रचनाएँ राजस्थानी तथा ब्रजभाषा में उपलब्ध हैं, परन्तु राजस्थानी का विशेष प्रभाव परिलक्षित होता है। गोस्वामी तुलसीदास की रचनाओं का सर्वाधिक प्रभाव इस युग की कवयित्रियों के काव्य पर पड़ा।

पंचम अध्याय

यह अध्याय कृष्ण काव्य धारा की कवयित्रियों से सम्बन्ध रखता है। मर्यादा पुरुषोत्तम राम का चरित्र जिस रूप में जन मानस का हृदयहार बना उससे अधिक कृष्ण का बाल चरित्र, रास लीला और विविध क्रिया कलाप प्रिय रहे। मध्यकाल में इसका एक मात्र कारण सूरदास थे। महाकवि सूरदास ने कृष्ण के बाल चरित्र एवम् वात्सल्य को जिस भाव भूमि पर प्रस्तुत किया उसे भारत के प्रत्येक हिन्दू ने भली-भांति आत्मसात कर लिया। प्रात: से लेकर सायंकाल तक विविध कार्यों में संलग्न स्त्री-पुरुष समान भाव से कृष्ण की भावभरी लीलाओं का संकीर्तन करने लगे। राजस्थान का जन मानस इस भावना से अलग न रह सका और अनेक कवि तथा कवयित्रियों ने कृष्ण लीला का गुणगान कर अपनी

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

वाणी को पवित्र किया। अति मधुर भाव से अभिव्यक्त काव्य की पुष्टि मध्यकालीन सगुण उपासना, राधा उपासना, गोपी भक्ति, रासलीला आदि से हुई।

षष्टम अध्याय

यह निर्गुण काव्य धारा की कवयित्रियों से सम्बन्धित है। मध्यकाल एक में और सगुण भक्ति भावना को धारा जन मानस में अति वेग से प्रवाहमान थी तो दूसरी ओर कबीर, रैदास, नानक, तुकाराम, ज्ञानदेव, नामदेव, दादू, चरणदास, जांभोजी आदि संतों के चलाये हुए निर्गुण सम्प्रदाय भी सक्रिय थे। इन सतों ने विभिन्न देवी-देवताओं के पूजन और पाखण्ड भाव के विरोध करते हुए ईश्वर की निराकार भक्ति प्रतिपादित की। समाज में सभी व्यक्तियों को ईश्वर की आराधना करने का अधिकार है। ईश्वर के दरबार में कोई छोटा बड़ा नहीं है। इस प्रकार की भावनाओं से अनेक कवयित्रियां प्रभावित हुई हैं तथा निर्गुण भक्ति भाव भरे ग्रंथों का निर्माण किया।

सप्तम अध्याय

यह अध्याय अन्य कवयित्रियों के परिचय से युक्त है। इसमें उन कवयित्रियों को स्थान दिया गया है जिनकी रचनायें श्रृंगार रस से परिपूर्ण हैं तथा जिनका जीवनवृत्त अज्ञात है और उनकी भाषा राजस्थानी है।

अष्टम अध्याय

यह अध्याय तत्कालीन सामाजिक, ऐतिहासिक तथा राजनैतिक परिस्थितियों से पूर्ण है। इस अध्याय में राजस्थान की महिलाओं की वीरता तथा उनके हंसते-हंसते जौहर की ज्वाला में कूद पड़ने तथा पति, भाई तथा पुत्र को रण क्षेत्र में जाने एवम् विजय श्री प्राप्त करने का सदेश देने वाली परिस्थितियों से युक्त साहित्य का वर्णन किया गया है।

नवम अध्याय

इस अध्याय में कवयित्रियों द्वारा काव्य मे प्रयुक्त किए गए छंद-अलकारों का अध्ययन किया गया है। कवयित्रियों के काव्य में छंद-अलंकारों का प्रयोग सहज भाव से किया गया है। उन्होंने विशेष रूप से उपमा, रूपक, उत्प्रेक्षा, अनुप्रास, अतिश्योक्ति आदि अलंकारों का प्रयोग किया है। छंदों के प्रयोग मे भी कवयित्रियां किसी से पीछे नहीं है छदों का प्रयोग भी प्रचुर मात्रा में किया गया है। वैण-सगाई अलंकार तथा राजस्थानी के प्रसिद्ध छदों, यथा—दूहा, झमाल, सुपंखरो, त्रिबंकड़ो, निमाणी आदि का सफल प्रयोग किया गया है।

इस प्रकार हम देखते हैं कि राजस्थानी साहित्य की महिलाओं का साहित्य साधना मे अतुलनीय योगदान रहा है। मैंने अपने अध्ययन का शुभारम्भ राजस्थानी साहित्य के उद्भव के विकास के साथ किया है तथा विकास क्रम

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

के अनुसार विभिन्न युगों की महिलाओं का योगदान प्रस्तुत किया है। ऐसा करते समय मैंने प्रत्येक महिला साहित्यकार की सम्पूर्ण जीवनी एवम् कृतित्व पर प्रकाश डाला है और उनकी महत्त्वपूर्ण कृतियों का परिचय देते हुए राजस्थानी साहित्य के लिये उसके योगदान का अध्ययन प्रस्तुत किया है। इस तरह लगभग ६० महिलाओं का सम्पूर्ण अध्ययन मैंने प्रस्तुत किया है।

मैंने अपने अध्ययन को अधिक उपयोगी बनाने की दृष्टि से विभिन्न महिला साहित्यकारों को युग के साथ-साथ प्रवृत्तियों और काव्य धाराओं में भी विभाजित किया। जैसे वीरता, भक्ति, शृंगार, नीति आदि तथा भक्ति के अन्तर्गत सगुण एवं निर्गुण महिला साहित्यकारों का अध्ययन किया गया है।

मैंने निर्गुण काव्य धारा की कवयित्रियों को संत साहित्यकारों में रखकर उन पर विस्तृत अध्ययन प्रस्तुत किया है।

इसी प्रकार सगुण धारा की महिला साहित्यकारों को गद्य तथा पद्य की विविध विधाओं के साथ-साथ शैव, वैष्णव तथा शाक्त सम्प्रदायों के अन्तर्गत विभाजित कर अध्ययन प्रस्तुत किया है। मध्ययुग में राजस्थानी साहित्य पर सगुण भक्ति धारा में सर्वाधिक प्रभाव वैष्णव भक्ति धारा का पड़ा, तत्पश्चात् राम भक्ति व कृष्ण भक्ति का भी प्रभाव पड़ा। इसलिए मैंने इस अनुसंधान में राम व कृष्ण भक्ति काव्य धारा की कवयित्रियों का परिचय प्रस्तुत करते हुए कृति विशेष का भी अध्ययन किया है।

मैंने शोध के विषय के साथ युग विशेष की परिस्थितियों का सम्यक उल्लेख करना भी आवश्यक समझा, क्योंकि ऐसी मान्यता है कि साहित्यकार युग और परिस्थितियों की देन हुआ करता है। अतः मैंने युगीन वातावरण का वर्णन भी विशेष रूप से प्रस्तुत किया है। तत्कालीन राजनैतिक, सामाजिक, आर्थिक तथा सांस्कृतिक परिस्थितियों को ससंदर्भ प्रस्तुत किया है।

युगीन परिस्थितियों के सन्दर्भ में महिला साहित्यकारों का योगदान सार्थक सिद्ध करना मेरा प्रयोजन रहा है। इस दृष्टि से शोध-प्रबन्ध का यह महत्वपूर्ण अंश है।

मैंने प्रत्येक महिला साहित्यकार को गद्यकार तथा कवयित्री दोनों ही रूपों में मूल्यांकित किया है और प्रत्येक रचना को उदाहरण सहित प्रस्तुत किया है जो एक श्रम साध्य कार्य है।

राजस्थानी साहित्य में डिंगल तथा पिंगल दो काव्य धाराओं का साहित्य उपलब्ध होता है। मैंने यद्यपि सामान्य परिचय के अन्तर्गत पिंगल साहित्य की महिलाओं का संक्षिप्त परिचय प्रस्तुत किया है, किन्तु मेरा इष्ट केवल डिंगल काव्य की महिलाओं का परिचय देना ही अधिक रहा है।

डिंगल काव्य धारा के अन्तर्गत जैन, चारण तथा अन्य वर्गों की महिला साहित्यकारों के योगदान का भी मूल्यांकन किया गया है। यद्यपि यह विषय

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

अत्यन्त विस्तृत है तथा प्रत्येक महिला साहित्यकार के व्यक्तित्व तथा कृतित्व सम्बन्धी अध्ययन के लिए पृथक शोध-प्रबन्ध की आवश्यकता है। इसलिए मैंने संक्षेप में राजस्थानी महिला साहित्यकारों के व्यक्तित्व तथा कृतित्व पर प्रकाश डाला है।

इतनी विस्तृत सामग्री को एक स्थान पर एकत्रित करने का यह श्रम साध्य कार्य राजस्थानी भाषा और साहित्य की श्री वृद्धि की दृष्टि से मुझे अत्यन्त महत्त्वपूर्ण लगा और शोध कार्य के पश्चात् मुझे अनुभव हुआ कि इस अनुसन्धान ने एक ओर एक अभाव की पूर्ति की है तो दूसरी ओर नवीन अनुसन्धान के अनेक मार्ग प्रशस्त किये हैं। यही मेरे अनुसन्धान की विशेष उपलब्धि है।

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

BLACK CONSCIOUSNESS AND THE AUTOBIOGRAPHICAL FORM WITH SPECIAL REFERENCE TO RICHARD WRIGHT MALCOLM X AND ELDRIDGE CLEAVER

MRS. SUDHI RAJIV

Abstract of the thesis accepted by the University of Jodhpur
For award of Ph. D. in English in the year 1985*

There has always existed an "unsuspected continuum" of black experience within American culture. White Americans could not divine it, and even when they did get a glimpse of it, tried to deny its existence. Even liberals and anti-racist scholars treated it as a "pathological projection of a people whose only hope, ostensible desire and practical destiny lay in integration." For black Americans it was a reality that gave them an insight into the natrue of their experience in America. In their struggle for recognition, they "developed group or race consciousness, a body of attitudes, sentiments and beliefs which serve to unify its members. At the same time it serves to isolate them from the larger society."

Because of the distinct nature of their experience "black people exist separately within America, while having to deal with America. A black knows two worlds, where the white knows only one." (Julius Lester) In his autobiography, *Black Boy*, Richard Wright seems to capture this dual existence when he relates his experience with the two ladies who would not go beyond the stereotyped attitudes. One lady chastised him for aspiring to be a writer. "I was quickly learning the reality—a Negro reality of the white world. One woman had assumed that I would tell her if I stole, and now this woman was amazed that I could not milk a cow, I, a nigger who dared live in Jackson .. They are all turning out to be alike, differing only in detail. I faced a wall in the woman's mind, a wall she did not know was there."

It was during the Harlem Renaissance that the "dissociation of sensibility" (George E. Kent's phrase) took place and group or

*This research work was done under the supervision of Dr. S.D. Kapoor, Associate Professor of English, University of Jodhpur, Jodhpur.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

race consciousness was explored and articulated for the first time. As a result, black writers began to isolate those elements that gave them a distinct racial character. They also discovered that they were treated differently not merely because of their skin colour but also because of the entire attitude with which the white Americans interpret the world. The crystallization of black consciousness that took place during this period was given a fuller treatment by later writers. It was Richard Wright who first pointed out that the black and white America were engaged in a war over the nature of reality. Black autobiographies show that their understanding and interpretation of reality are different and also valid.

Since black autobiographies are closer to factual reality, they catch the contours of black consciousness in their vibrant form. "Black autobiography has to do with the black experience, how it felt to be a black and a slave, how the world looked through the eyes of one who had achieved a measure of freedom by effort and suffering, who the people were who had passed through the ordeal, how they had expressed their thoughts and feelings." A new dimension was added to black autobiographies when Eldridge Cleaver and Malcolm X related their problems to larger issues that confront the oppressed people all over the world.

Because of the commonality of their experience, black autobiographies enact the drama of the entire race rather than of an individual as one notices in white autobiographies. W.E.B. DuBois calls his autobiography *An Autobiography of a Race Concept*. "My living," DuBois writes, "gains its importance from the problem and not the problem from me." It is for this reason that black autobiographies have not been given the treatment they deserve. "One reason why we have not had more literary discussion of the autobiographies like Malcolm X may be that many black intellectuals remain profoundly suspicious not only of formal literary criticism but also of autobiography as a traditional European genre committed to individualism."

The three autobiographies—those of Richard Wright, Malcolm X and Eldridge Cleaver that have been discussed in this thesis and the movements that they embody show that the judgments made by black autobiographers are "necessarily different from that of the white sensibility—different and after all is said and done—inimical." Black autobiographers show the movement from the consciousness of their predicament, an analysis of America's racism to a way out of the existing race relations. It is here that black autobiographies have a great contribution to make. They posit an alternative to the materialistic civilization that is

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

satisfied with the acquisition of trinkets and trash. The question that Richard Wright posed in *American Hunger* : "What happens to the Negro in relation to the aspirations of Western society ? Could he save a confused, materialistic nation from its own drift toward self-destruction ?" was taken up by Malcolm X and Cleaver who not only provide a critique of white society but also take black consciousness in new directions.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

FEMININE POINT OF VIEW IN THE NOVELS OF ELIZABETH BOWEN

MRS. SWATANTAR KAPOOR

Abstract of the thesis accepted by the University of Jodhpur
For award of Ph.D. in English in the year 1985*

Commenting on the state of contemporary fiction Elizabeth Bowen wrote in *Seven Writers and Afterthought*: "it is perhaps a comprehension, and a realization of our own time." Fiction for Bowen was a way to comprehend truth. And she achieved this not in the manner of 'intellectual novelists' who deal with technique and extreme subjectivism, whose disloyalties will take the form of conscious disengagements from publicly held faiths or theories but in the manner of an 'intuitive writer', the product of an intensive environment—racial, local, or social.

Her novels study the changing relationship between characters and their milieu. They embody the dilemma of the self when confronted with an intransigent world. The self is 'wrapped up', takes recourse to fantasizing, shuttles between feelings and values, chaos and order and ultimately finds some solace in the vestiges of tradition and values buried under the cracked up surface.

Although other writers "have been reduced to absolute silence by the state of the world—not through lack of faith in their powers but by some feeling that what they are creating is futile and why go on," Bowen was not affected like this at all. The writer, according to her, must behave with a certain amount of 'demeanour' and must be praised for 'not contributing to anarchy'. "Just as in an air raid, if you were a warden, which I was, you stump up and down the streets making a clatter with the boots you are wearing, knowing you can't prevent a bomb falling but thinking, 'At any rate, I am taking part in this; I may be doing some good'." (*Pictures and Conversations*).

The perspective for studying her novels has been provided by

*This research work was done under the supervision of Dr. S.D. Kapoor, Associate Professor of English, University of Jodhpur, Jodhpur.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

feminists like Kate Millet, Greer, Friedan and Beauvoir and critics like Raymond Williams, Lionel Trilling, Michael Zaraffa and Malcolm Bradbury and others. Although Elizabeth Bowen does not take an avowed feminist stance, she does believe that women have special gifts like "flexibility, quickness in the uptake, sensitiveness and a sympathetic attitude towards the other persons point of view." ('Do Women Think Like Man.')

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

THE INDIAN DEMOCRACY ITS FUNDAMENTAL CHALLENGES AND PLAUSIBLE SOLUTIONS

MADHU BHATNAGAR

Abstract of the thesis accepted by the University of Jodhpur For award of Ph.D. in Political Science in the year 1985*

The research study entitled, 'The Indian Democracy : Its Fundamental Challenges and Plausibl Solutions', is a macro-level generalised attempt to understand, analyse and evaluate the problems and complexities of our democracy. The democracy is a difficult form of government and it is more so in the Indian context, because of extreme poverty, abject backwardness and ignorance. As such solution can, at its best, be tentative and plausible.

Since it is a macro-level generalised study, the tools and techniques of modern behavioural researches can hardly be applied. The study has been undertaken through a curious mixture of the traditional methods. The approach is based on the application of methods, such as historical, philosophical and observational, combined with evaluative and interpretative norms. It is a critical appraisal of India's democracy and a peep into its futuristic trends.

The study has been undertaken in nine chapters. The introductory remarks are contained in Chapter I, and the basic challenges to Indian democracy have been analysed in Chapter II. The phenomenon of sub-nationalism, its causes and consequences, has been depicted in Chapter III. The role and importance of Leadership and bureaucracy and their crisis have been analysed in Chapters IV and V. What structural changes ought to be introduced in the Electoral System ? This is the theme of Chapter VI. The trends and behaviour of political parties and the phenomenon of stability form the core of Chapter VII.

*This research work was done under the supervision of Dr. L.S. Rathore, Professor & Head, Department of Political Science, University of Jodhpur.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

The Chapters VIII and IX are vision-oriented and contain suggestions and recommendations. Taking a cumulative survey of all these Chapters, their ideas, approach, and contents could be briefly presented in the following style.

The experiment of Democracy in India is the boldest in a transitional polity striving towards modernisation. In a number of Third World countries, which started from democracy, the experiment has failed giving place to authoritarian systems of government. However, one comforting solace about Indian democracy, is that despite heavy obstacles and difficulties, the process is still functioning. That should not blind our eyes to reality. The democracy in India is passing through an acute crisis. The crisis is the result of varied factors. The low level functioning of political parties, the narrow thinking of political elites, the rising regionalism, the onrushing separatist tendencies, the linguistic, ethnic and religious conflicts, the existence of extreme poverty and wide spread inequalities, the unhealthy intermediate groups, the political blackmailing and defections, and other internal divisive pulls and counter-pulls, have vastly eroded the effectiveness and legitimacy of democracy in India.

THE GRAVITY OF THE CRISIS

Another interesting work on the working of Indian Democracy is by Ronald Segal. The work is entitled as 'The Crisis of India'.[1] The author starts with an interesting dialogue. After coming to India, the author asked a fellow-traveller (who had been to India) the question : whether he liked Indians or not ? The fellow-traveller cried, "Liked them, I hated them !" He continued to say, "They are dirty and submissive lot, with no flame on fight in them, swaddled in superstition and apathy and a meaningless arrogance. The rich are revenous and corrupt, and the poor are drained dry almost of the will to survive. The government is muddled and ineffectual, the country is in a hopeless mess, and the calamity of one kind or another is unavoidable". The author after having stayed in India for three months and having travelled seven thousand miles, agreed with the above version of his fellow-traveller. The author writes, "I understood the rage. I, too, hated the dirt and the submission, the superstition and apathy, the greed and the corruption, and the endless, astonishing and affronting poverty". This indicates the crisis of democracy in India.

Ronald Segal enumerates a number of factors for this crisis. The main factors, according to him, are caste, custom, poverty,

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

corruption, and the great hiatus between the intention and achievement. The Indian caste system[2] is a strange one, it retards the development of the polity. The castes have their own schools and community centres, libraries and scholarships, and it even shelters its members in times of sudden distress. The caste is a disease of humanity, for it disintegrates social responsibility. Secondly, it is very difficult to understand the out-dated customs in India. The out-worn customs are a great obstacle in the working of democracy in India, for they restrict the vision of the individual and introduce worst elements of parochialism and narrow thinking in them. Thirdly, the corruption has become an accepted norm in the Indian polity. The enormous use of bribery, adulteration in almost all walks of life, tax evasion, illegal gratifications, lavishness of the Raj Bhawans, and widespread embezzlements, do indicate that corruption is fast becoming an endemic disease in the Indian polity. Added to these, is the profound and pervasive poverty. India has been living too long on a ledge of the economic precipice, frightened both to climb and to fall. But the ground is crumbling beneath her, and if she does not begin speedily to grope her way upwards she must soon fall below. This indicates the magnitude of the economic crisis and poverty. Not only poverty, but every where in India, one can see the sights of great hiatus between needs and resources, claim and reality, intention and achievement. All these factors operating jointly have introduced enormous confusion in the working of democracy in India. And Ronald Segal concludes, "Economically, the country is on the lip of precipice, there is a tragic hiatus between her needs and resources, her intentions and achievements......... India's salvation lies in the hands of Indian alone". We may not like the analysis of the Indian democracy, coming as it is from the pen of a foreigner, but if the situation is viewed objectively, Ronald Segal's assessment contains enormous seeds of prudence for the policy-framers as well as the individuals in India. The crisis of India is in reality a crisis of tremendous magnitude, and the alarm has begun to sound. Only a determined effort at each level, combined with economic development, and cosmopolitan thinking, can avert this crisis, otherwise the consequences would be alarming.

THE DANGEROUS DECADES

Selig S. Harrison in his interesting book entitled 'India : The Most Dangerous Decades'[3] makes an interesting analysis of the Indian democracy. He enunciates a number of factors hindering

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

the democratic process in India, and finally takes a pessimistic view of the prospects of democracy in India. The main obstacles in the working of democracy in India are varied, such as caste, new regional elites, and other centrifugal tendencies. He argues that caste is no longer perforing its integrative function, it has become a factor of immense disintegration. The increasing solidarity of castes over large geographical distances, has led in some ways to a strengthening of the caste spirit, a spirit which has a new element in it; it is competitive. This is indeed a spirit new to caste, for the traditional role of caste has been to minimize competition and to promote the spirit of live and let-live. The traditional role of the caste has eroded. The caste-identity has been intensified. Each caste is trying to grab as much economic and political concessions as far as possible. The caste conflict and competition has been further intensified in view of the reservations offered to scheduled castes aud tribes in the Indian Constitution. The problem has become acute, because of the economy of scarcity. Added to the caste, is the problem of new regional elites. A number of factors have led to the growth of new regional elites. The demand for regional languages, the regional development, the theory of the sons of soil, and the quest for regional identity, have led to the growth of a new regional elite in the Indian polity. The national elite is fast dwindling and a new breed of regional elite is gaining in size and number. This emergence of regional elites, has restricted thought, it has undermined the cosmopolitan character, and it has introduced a new parochialism in the polity. The rise of these new regional elites will exercise a profound influence on the future of Indian political life and this would be basic challenge to the democracy in India. It could thus be said that, according to Selig Harrison, caste and regional elites are the endemic challenge to national unity. The caste and regional elites have introduced inter-regional rivalries, and their scramble to get the biggest slice of the economic cake in India, have introduced a low level of political and social indiscipline in the competition. They have introduced abundant centrifugal stresses in the Indian polity and India, thus, is passing through the most dangerous decades. Selig Harrison quotes with approval the words of C. Rajgopalachari, when he writes, "The future is in the hands of Gods, but as far as I can judge, the centrifugal force will ultimately prevail, and the nation may be compelled to go through a period of political anarchy and face the risk of fascism, which is Nature's way out of disorder and misrule".

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

Anyhow, the struggle for national survival in India is a struggle within every Indian. The latent parochial instinct in every Indian is extending its umbrella and this self-centred instinct, is one of the most formidable challenge to the democracy in India. Selig Harrison's assessment of the Indian democracy done in 1960, is extremely prudential for the leaders as well as scholars, if we analyse the divisive trends and counter-pulls in the working of the polity, and even more so during the last decade.

A CONGLOMERATE SYNDROME

Paul Harrison's two books entitled, 'Inside the Third World' and 'The Third World Tomorrow', are interesting classics for the understanding of the problems of democracy in the Third World countries. Although written in a journalistic style and broad generalization, the insights contained in these books, give a deeper understanding of the problems of democracy in India. In the first book 'Inside the Third World'[4], a number of problems have been analysed. The problems facing Indian democracy are many and varied, such as poverty, agricultural and agrarian problems, primitive technology, increasing landlessness, exploding cities, population explosion, malnutrition and disease, internal and external problems, and unequal and faulty distribution of resources. Added to these are the social strains and the political instability. Even the development policies are biased against the poor, the backward, the rural and skewed in favour of the rich, the Westernized and the urban. There is a great gap between the theory and practice of development policies. It is politics that determines the direction of development, and the privileged groups have infinitely more access to political power than the poor. The overall result is pronounced inequalities. The benefits of development ought to have gone to the poor, but they are still under-fed, under-employed, illiterate, ill-housed and ill-health. Although in theory, the focus of development is the poor, but in practice the dominant trend is unequal development and the poor are continuously growing poorer, rolled over and crushed. Further, the democratic system in India is replete with corruption. Corruption riddles every part of public edifice like a bad infestation of wood worm. It is a cancer at the heart of Indian democracy. It eats away at the foundations of trust between people and their rulers. It exemplified the two key weaknesses of the developing Indian State : the unholy marriage of political and economic power, where by money buys influence, and power attracts money; and the 'softness' of the

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

State (its inability to apply and enforce its own laws and regulations) so that reform, even it is legislated, rarely gets put into effect. Again, apart from internal problems, India is passing through an era of external instability. It has led to the excessive growth of armies and defence expenditure. The armies are regularly employed for suppressing dissent at home and waging war to protect its frontiers. The internal instability of India makes it more prone to external conflicts : poverty and strife at home may help to turn border disputes into outright wars.

A new source of political instability and conflict is gaining increasingly in India : social polarization and poverty. The absence of a sizeable middle class is a danger for stable democracy. Where States are polarized into a rich elite and a mass of poor people, the poor have nothing to lose from rebellion, while the rich have too much to lose from reform. There is no middle way : he who is not for reform is against it. For any meaningful change to occur, one side must lose what the other side gains. This exactly is the situation in India, and its futuristic consequences would be highly damaging to the polity.

The poverty and inequality are both deepening in India. Increasing poverty and inequality have spelled political trouble throughout history and India is no exception. In India today they have become more explosive than ever, because they have been accompanied by what has been called the revolution of rising expectations. This has been generated by government rhetoric and the growth of the affluent but small modern sector, to which everyone feels called but few are admitted. The whole of the country is tense with expectations that have risen way beyond the limits of possibility. Amidst such an environment of inequalities, freedom stands little chance and it is useless to press for political and civil rights without pressing for the kind of equality that makes them meaningful. If prosperity does not spread more rapidly to wider groups, and if the absolute poverty of the poorest is not alleviated or eradicated, dictatorship of right, left or centre is likely to be dominant form of government in the years ahead. What India needs now, for rapid development benefitting all, is re-distribution, co-operation, emphasis on production, autonomy, self-help and participation. A co-ordinated assault on poverty and inequality in India, supported by internal stability and external security, may perhaps be the best way of strengthening prosperity. The poverty and inequality have to be eliminated. As Paul Harrison puts it, "But if they do not happen, or are delayed intolerably, the political troubles

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

will be much more protracted, and more bloody"[5]. In the last analysis only a frontal attack on poverty can save the collapse of democracy in India.

REGIONALISM

Regionalism is a unique phenomenon in the Indian politics. It has already been treated elsewhere in the thesis. At this stage, it is not appropriate to indicate its origin and causes. The fact is that regionalism is hindering the progress of Indian polity. The process of regionalism has acquired different overtones in the different parts of India. In the North, it is broadly expressed in the Hindu-Muslim antagonism. In the South, language, community or caste or economic discrimination have been responsible for its growth. In the State of Punjab, despite its economic development, the phenomena of regionalism has assumed dangerous proportions. It has to some extent, become separatist. Elsewhere, in Assam the problem is that of 'identity crisis', or 'the sons of the soil' concept regarding employment. The phenomenon of regionalism has accelerated violent agitations, uprisings and riots in the course of the years.

The regionalism is a powerful factor in State politics, causing tension at the social levels and affecting the political process in the form of defections among legislators and party leaders, switch over and dropouts among voters. Regionalism is unmindful of the existing organisational set-up and creates its own viable organisation such as political party alongwith its ancillary organisations. It could neither be contained by the existing legal or constitutional arrangement nor arrested through the modernizing forces of urbanisation and industrialisation. The task of nation-building, therefore, has to face the challenge of and fulfil itself through regionalism.

G. Rama Reddy and B.A.V. Sharma in their study entitled, 'Regionalism in India : A Study of Telengana'[6] conclude by saying ; "Regionalism is thus a chaotic response to the dysfunctional nature of the State's political system. It may be the consequence of the imbalanced economic growth of regions or of elements not yet fully integrated but is an effective weapon to draw attention to a genuine grievance. By its very nature, it can not be sustained for long". Their observation may be true so far as Telengana is concerned, but if applied in the case of Punjab, the finding has little relevance. Punjab is economically the most prosperous State in India, and here regionalism has latent separatist tendencies. The point is that if regionalism

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

operates within the gambit of a specified area it is tolerable, but when it assumes offensive overtones, threatening the very integrity of the country, the phenomenon becomes delicate and dangerous.

THE POLITICS OF SCARCITY

Myron Weiner in his highly important research study entitled, 'The Politics of Scarcity',[7] unfolds the main problems of Indian democracy. His argument is that a high level of aspirations and a growing level of political organisations present special problems in an under-developed country where resources are scarce. The question is : Can this gap be narrowed by economic growth ? The economic growth leads to increase in voluntary political organisations and this causes gap between aspirations and reality. While it provides government with increased resources for satisfying organisation demands, it is accompanied, on the other hand, by a growing mobilization of groups exerting pressure on government. The economic growth can, therefore, be politically unstabilizing. It is also likely to be unbalanced. It is likely to be accompanied by a rise in organised demands. Thus economic growth is not likely to diminish the political repercussions of scarcity. Similarly, the economic stagnation offers no solution either, for the demands have already reached such a level that no government, and perhaps no political system, could survive stagnation for long. Therefore, Myron Weiner argues that one must look beyond the sphere of economics to find ways to progress and survive in a polity of scarcity. The central problem, therefore, is increasingly that of the implementation of planning process. The problem of implementation is essentially that of politics, social organisation, cultural values, and human factors. Due to the morbid growth of these factors, the result is often a great hiatus between law and reality, between what is willed by the national leadership and what is done at the local level, between the high ideals in New Delhi and the cynicism in the mofussil towns. This is the real problem in Indian democracy, as argued by Myron Weiner, and it contains enough insight into the problem. In order to face this problem, Myron Weiner pleads for the development of a legitimate and stable democratic infrastructure in India, which is contingent on the development of a bargaining culture in the key roles of the political system, that is, in the political parties, in the bureaucracy, and among the interest groups. Such a culture does not develop spontaneously. For the development of bargaining culture, the infrastructural agencies and institutions

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

have to acquire a level of maturity. This is a long and tardy process and specially in the politics of scarcity.

POPULISM

It seems that in India the democracy is heading towards populism and the entire power structure has become 'static'.[8] The political situation in India is highly amorphous, tentative, confused and ad-hoc. The crazy patch work quilt of parties and parties within parties, existence of splinter groups, self-seekers among leaders and related factors, have made a mockery of democracy. The political parties are less doctrinal and more populist, and they rely on street politics of mass agitations. The slogans like socialism, communism, regionalism, nationalism, and like, are more to hoodwink the masses, and they are meant to capitalise on the discontent of the people. The political defections, brute quest for political power, viotation of constitutional norms and values, lust for money and unethical alliances, all indicate the populist trend in Indian Politics. The legislators have become 'potential blackmailers'.

The populism to some extent is the by-product of Gandhian techniques of disobedience and non-cooperation. Gandhiji had provided the safety values like constructive work, village uplift, discipline and the like. These safety values do not exist today. We are today left with naked populism of the political parties. It may be emphasized that populism is not inconsistent with the formal democratic structure but it totally destroys the essence and ethos of the latter and ushers in the politics of total dysfunctionalism and economic immobilism. Populism can be described as 'dysfunctional democracy', in which every party tries to outbid the other in first creating and then exploiting the resentment of the masses. When in power, the populist parties will act as 'distributing' rather than as 'producing' parties.

This growing populism has deteriorated the political life in modern India. It has led to howling cynicism, pessimism and disgust. What India, therefore, needs is a dedicated cadre among political parties. An enlightened leadership at all levels, with a real spirit to serve the people, is required. We should not abolish the institutions, but ought to accelerate social and economic reforms, so that the social debris collected over centuries, may be removed. This is the function of political elite.

PLURAL NATURE OF THE SOCIETY

(Late) K.M. Panikkar, who was a scholar of outstanding repute, has given some sketchy references about Indian democracy in his

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

work entitled, 'The Foundations of New India'[9]. Panikkar takes the view that, although regionalism has certain undesirable features (such as a sense of superiority over neighbouring groups, parochialism and the like), but this does not, in any way, affect the national interests. He feels that regionalism has certain special qualities, such as, the 'inoffensive vanities', which cause a temporary sense of jealousy but do not affect national interests. It is true that so long as regionalism operates within a specified framework, it may not be injurious to national interests. But the point is that in recent years, regionalism is no longer 'inoffensive', it has become offensive, separatist and parochial, and it is here that it becomes a threat to national integrity and solidarity. Further, K.M. Panikkar does not take a pessimistic view about caste, as has been done by a number of foreign scholars. He says that caste continues to throw its shadow on the social scene. "It is undoubtedly a diminishing factor in Indian life and yet the time has not come when we can say that it is merely a survival without an active hold on people's minds. Caste, so long as it is considered the identifying feature of Indian life, will certainly disappear though its dying pangs may still cause pain and misery". According to K.M. Panikkar, caste and regionalism are not important problems in Indian democracy. The real problems, he writes, are the 'durability of change' and the 'plural nature of Indian society'. In his words, "the real question which will determine the importance of the Indian revolution in world history is the durability of the change now taking place in India"; and "the problem of India arises not out of lack of integration but of the plural nature of Indian society". These two observations of K.M. Panikkar are highly significant so far as the future of democracy is concerned.

DIVERSITY AND NATIONAL UNITY

To what extent diversity is a threat to national unity in India? A systematic research study on this theme has been done by Baldev Raj Nayar in his book entitled, 'Minority Politics in Punjab'[10]. Although the focus of the study is Punjab, but its findings are highly relevant. The author argues that the relationship between diversity and national unity, as well as that between diversity and democracy, is much more subtle than pessimistic statements have implied. He states that the wide diversity within and between the States in India provides an assurance against domination by any single group and, in turn, enables different socio-religious groups to look to the centre for protection.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

The diversity further contains a favourable potential for democracy, protection of minorities, safeguarding of liberties, egalitarianism and social change. The major problem, then, is how to maintain a viable political system in the face of these divisive internal threats to its existence ? While priority for economic and industrial development is not denied, the primary concern is still how, in some way, to hold the system together. The economic development may even intensify divisive conflicts, if it fails to create non-parochial economic loyalties. The social diversity in India is not a danger, but once the social diversity results in divisive pressures, it becomes a serious problem for a nation engaged in the gigantic tasks of nation-building. The divisive forces, such as, linguistic—cultural regionalism, religion-based communalism, and casteism, if they become dominant, then the threat is a real one. These divisive forces give rise to two types of leadership—nationalist leadership and parochial leadership. Both these categories of leadership are contrary and opposite to each other. Amidst the politics of diversity in India, the quality and nature of leadership is very significant. The goals the political leaders seek, the resources they have and the political strategies they employ, may be highly significant for prospects of stability in India. It is tragic to record that in recent years the cadre of nationalist leadership is squeezing in size, where as the parochial leadership is multiplying like mushrooms. This proliferation of parochial leadership is the real threat to Indian democracy. The leadership and national unity are closely inter-related. Only a dedicated cadre of nationalist leadership can save the Indian democracy from ruin and dereliction.

A SICK MAN THAN A PIONEER

A.H. Hanson and Janet Douglas in their work entitled, 'India's Democracy'[11], characterise it as 'a sick man than a pioneer'. The authors cite a number of drawbacks in Indian democracy. India is a vast country and in it every type of societal division is found. The religion, sect, language, caste and class have created a number of problems. The political parties and the pressure groups, by their peculiar brand of operation, have added new dimensions of confusion. Added to it is poverty. There is a gap between rural and urban life. Infact, the entire politics is poverty inspired. The existence of poverty, unemployment, inequality, and population increases, have further complicated the situation. The authors, therefore, say that

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

these problems dominate India's future and, given the rising expectations of her people, are likely to lead to mass frustrations which endanger possible disintegration.

It would be a great tragedy if India's experiment of combining political democracy with economic development would run into the sands. There was a time, during Nehru era, when India was the hope of well-informed and progressive people. Today, India looks much more like a sick man than a pioneer, and in the manner of sick man, she is directing her attention inwards with agony and disgust. The path, through democracy to socialism, which India was hopefully treading now appears bestrewn with formidable obstacles, and there appears no immediate solution to grapple with the intricate situation. Starting from the bright hopes of a social-democratic nation, it has arrived at the stage of a 'sick man'. Such is the agony and such is the tale. Before India can aspire again to the heights where Nehru briefly lifted them, India will need to cure her sickness. Whether India can or not is one of the unanswered and unanswerable questions, for no one can as yet say whether it is a severe attack of something comparatively trivial or a wasting disease.

THE PROCESS OF ACCULTURATION

The democracy in India, it seems, is passing through a process of acculturation, and there is a curious conflict between the tradition and the modernity. The modernity is reflected in its desire towards Westernization and tradition is visible in its deep rooted social milieu. Religion is one of the factors for the understanding of the processes of democracy in India. Despite the fact that the Indian Constitution has boldly proclaimed the ideals of secularism, but in practice the various cultural groupings and religious sects are operating on the lines of narrow theories of nationalism, or 'Panth' or 'Kaum', and on the other hand, the country is trying to adopt the Western modes and styles in the economic, political and social affairs. A process of acculturation[12] has been operative, meaning thereby, that the Indians have switched over to the Westernized mould with all its legalistic, organisational, economic, industrial, and military adaptations that this implies. In many instances, this has demanded a high price, especially since modernism, in the sense of Westernization, either conflicts with tradition or requires the re-organisation of traditional patterns of thought, belief and behaviour. Thus, there has occurred a conflict within the trends of tradition and modernity. How to synthesize these

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

two trends in a harmonious manner, is perhaps one of the most acute problems of Indian democracy. Added to this feature, is the problem of demography and poverty and the issues become complex indeed.

POVERTY AND PROGRESS

The significant problem of Indian democracy is to accelerate change and progress, so that poverty could be eradicated. India represents the heart of under-developed world. It gained its independence in 1947, after roughly two centuries of colonial rule, and is, therefore, inexperienced in self-government. With a population of nearly 800 millions squeezed into territory which is one third the size of the United States, India typifies a general plight in many ways. With a growth rate that would see the country's population nearly to one billion before the year 2000 A.D., India has been in a constant—and sometimes losing—race against hunger. The people are divided along tribal, religious, or linguistic lines. They are severly afflicted by the problems of under-development; illiteracy; disease, poor diets, rapid population growth, primitive methods in agriculture, low levels of industrialization, mounting levels of urban unemployment as the landless floods into the cities and a host of attendant political, social and economic ills, India remains a deeply impoverished nation, still facing the travail of economic and social transformation, whose efforts to feed, house, and educate a rapidly growing population are far from assured of success.

The famous economist Robert L. Heilbroner has written : "The trouble with India and Pakistan......is not merely that economic growth lags, or proceeds at some pitiable pace. This is only a symptom of deeper-lying ills. The trouble is that the social psychology of these nations remain so depressingly unchanged despite the flurry of economic planning on top. The all-encompassing ignorance and poverty of the rural regions, the unbridgeable gulf between the peasant and the urban elites, the resistive conservatism of the village elders, the unyielding traditionalism of family life—all these remain obdurately, maddeningly, disastrously unchanged".[13] The development, if it is to come at all, must come on many levels—political, social, intellectual, psychological, and economic. In India, the ineffective government, social divisiveness, inflexible rural traditions, or sizable population increases have crippled development plans. To accelerate progress and development, against all these heavy odds, is a challenging task. It is high time, and the policy formulators

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

must focus attention on the social and political framework in which economic development must take place. The pious hopes and plans ought to be implemented with dedication and zeal, and the attitude of softness ought to give place to disciplined way of life.

A FUNCTIONAL ANARCHY

It is true that the democracy in India is functioning despite all obstacles and heavy odds. But its functioning is totally in a confused state, which led the former American Ambassador to India, John Galbraith, to coin the phrase, 'a functional anarchy'. This seems to be an appropriate reflection on the Indian democracy. A widespread poverty, the citizens apathy, debased ethical codes of political elites, a long tradition of autocracy, disturbing legacies of the border wars, inadequacy of trained manpower, routine functioning of bureaucracy, and the fluctuating loyalties of political parties, all have introduced a high level of confusion in the Indian democracy. Further, India is troubled with the problem of large and local minorities which undermine internal unity. The classical conditions of democracy, such as, high level of literacy, general level of prosperity well above subsistence, social homogeneity, a strong and large middle class, mobile interest groups, polarisation of political parties, nationalist oriented elites, vision oriented administration, and related essentials of democracy are lacking. As such, the masses every where in India are rather confused about democracy. The masses often hear about the strange notions of democracy, such as Sukarno's 'guided democracy', Ayub Khan's 'basic democracy', Bhandarnaike's 'substance of democracy', J.P. Narayan's 'partyless democracy', and King of Nepal's 'panchayat democracy'. Amidst such a clutter of democratic labels, they have hardly been able to grasp and understand the real substance of democracy. It is highly unfortunate. A total revolution at all levels is needed so that the essential conditions for the success of a democracy, may be achieved. The functional anarchy must give place to functional harmony, equilibrium and a balanced functionalism.

THE FUTURISTIC MODEL

The democracy in India is passing through a period of grave crisis. This crisis is the result of a cumulative operation of varied factors, that have been discussed in this thesis. To say that for a country in a transitional stage of development, such symptoms of dysfunctionalism are natural, is not enough. The

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

point is that the trend of dysfunctionalism is growing in magnitude and propensity. It is, therefore, highly essential to re-invigorate the polity, so that it may move towards the noble ideals as enshrined in the Constitution.

The main problem of Indian democracy could be presented in a nutshell : to remove poverty and inequalities, without destroying the social and cultural values. It could be presented thus : "There has to be a way to remove the curse of want while conserving the original values of Third World Societies. There must be a set of means that do not just expand material wealth, but also point towards, and are in harmony with, a worthwhile set of ends and values."[14] For the achievement of this goal, new development strategies have to be evolved, to eradicate poverty and to preserve the social values. The guide lines of the new model can be illustrated broadly. The central value implicit in the new strategies ought to be equality of wealth and power. It would lead to a society without pronounced contrasts between rich and poor, where the rewards of intellect and of manual labour shall not be grossly divergent, where people shall not be consumed by envy and shall be motivated by the desire to catch up with or get ahead of one another.

Much greater equality of power is the second major goal, implicit in it is the ideal of participation to be favoured by the new development approaches. Participation reduces costs and mobilizes the most valuable of all underused resources : human energy and creativity. But participation also implies democracy in the workplace and the community. Ultimately, equality of power must mean participation by workers on controlling the means of production, and control by residents over their own housing and neighbourhoods. Control by way of elected representatives is not enough : participation means that every one has to become involved in making the decisions that affect them directly through neighbourhood and factory assemblies, permanent ongoing democracy, not the occasional right to choose a new set of rulers.

The third major common strand in the new strategies is co-operation. Self help has to be strengthened by mutual help. Learning of development skills is speeded up when it is pursued collectively. The ideal becomes a network of egalitarian communities whose members pursue co-operative self-improvement, not individual self-advancement.

The fourth principle is respect for nature and natural resources.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

The growth that does not respect the natural world, its complexity and its sensitivity, limits itself. Resources are exhausted, eco-systems collapse, species disappear and our own physical and mental health and even our survival are threatened. As such, it is of utmost importance to preserve the nature and the natural resources.

The last principle, as is often advocated by many, is to introduce structural changes in the Constitution and the administrative apparatus. The reform in the administrative systems is most welcome, but mere structural changes in the Constitution would hardly help us. (Late) B.R. Ambedkar was perhaps right when he said in the Constituent Assembly : "If this Constitution fails, the future generation would say that the man was vile". What we need is dedication and zeal, exuberance and motivational force, and the character and discipline. In the absence of these qualities, the mere structural changes would hardly leads us to the goal.

The mankind today has reached a point where it is not enough to develop material wealth. It must now learn how to distribute that wealth fairly, and how to develop all human beings to their full physical and psychological potential, in harmony with nature. If that can be achieved, or the pace is further quickened, the future of democracy can be assured. However, one should not be disheartened with set-backs and failures of democratic experiment in India. India is a big political laboratory, inhabitated by diverse brands of people, and such pitfalls are natural. Let us, therefore, strive hard with a hope and a faith. It would be relevant here to conclude by a famous sentence written by Lord Bryce : "without faith nothing is accomplished and Hope is the main spring of faith. Throughout the course of history, every winter of despondency has been followed by joyous spring time of hope. Hope, often disappointed but always renewed, is the anchor by which the ship that carries democracy and its fortunes will have to ride out this latest storm as it has ridden out many storms before. There is an Eastern story of a King with an uncertain temper who desired his astrologer to discover from the stars when his death would come. The astrologer, having cast the horoscope, replied that he would not find the date, but had ascertained only this that the King's death would follow immediately on his own. So may it be said that democracy will never perish till after Hope has expired". These words of Lord Bryce are prophetic. Hope and faith are the cardinal virtues that can restore equilibrium in the democratic

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

process in India; if both are lost, the alternative is gloom and fascism.

NOTES AND REFERENCES

1. RONALD SEGAL, *The Crisis of India*, Bombay, Jaico Publishing House, 1971.
2. For further analysis of Caste in India, a reader is advised to consult the following books :
   (a) TAYA ZINKIN, *Caste Today*, Oxford, 1962.
   (b) M.N. SRINIVAS, *Caste in Modern India and Other Essays*, Bombay, Asia Publishing House, 1962.
   (c) G. MORRIS CARSTAIRS, *The Twice Born*, Hogarth Press, 1961.
   (d) KUSUM NAIR, *Blossoms in the Dust*, London, Gerald Duckworth & Company, 1961.
3. SELIG S. HARRISON, *India : The Most Dangerous Decades*, Madras, Oxford University Press, 1960.
4. PAUL HARRISON, *Inside the Third World*, Penguine Books, 1979.
5. PAUL HARRISON, *The Third World Tomorrow*, Penguine Books, 1980, P. 305.
6. G. RAMA REDDY AND B.A.V. SHARMA, *Regionalism in India : A Study of Telengana*, New Delhi, Concept Publishing Company, 1979.
7. MYRON WEINER, *The Politics of Scarcity*, Chicago, University of Chicago Press, 1962.
8. J.D. SETHI, *India's Static Power Structure*, Delhi, Vikas Publishing House, 1969.
9. K.M. PANIKKAR, *The Foundations of New India*, London, George Allen & Unwin Ltd., 1963.
10. BALDEV RAJ NAYAR, *Minority Politics in Punjab*, Princeton New Jersey, Princeton University Press, 1966.
11. A.H. HANSON AND JANET DOUGLAS, *India's Democracy*, Delhi, Vikas Publishing House Private Ltd., 1972.
12. ROBERT SPENCER, (ed.), *Religion and Change in Contemporary Asia*, Bombay, Oxford University Press, 1971.
13. op. cit., IRWIN ISENBERG, (ed.), *The Developing Nations : Poverty and Progress*, New York, The H.W. Wilson Company, 1969, P. 13.
14. PAUL HARRISON, *The Third World Tomorrow*, Penguine Books, 1980, p. 343.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

THE NATURE OF INDIAN FEDERALISM : EMERGING TRENDS

(MISS) RANU JHOTA

Abstract of the thesis accepted by the University of Jodhpur
For award of Ph.D. in Political Science in the year 1985*

The Indian federal system is the product of historical forces. The emphasis on national unity was one of the prominent features of the Indian National Movement. Indian nationalism was based on the commonly accepted principle that the country had a glorious past and the decline was due to disunity and dissensions among the people. The partition of the united India was a major jolt to the philosophy of Indian nationalism so assiduously cultivated during the long struggle for independence. This emphasis on national unity was further strengthened in a comparatively rapid process of integration of the Princely States with the Indian Union. Though isolated proposals were made here and there for framing a unitary constitution for the country on grounds of economy and unity, the consensus or the widely accepted view was in favour of a federal structure consistent with the maintenance of national unity and security. During the thirties the different aspects of a federal arrangement were discussed against the backdrop of India's diversity. The Government of India Act, 1935 was designed to embody the federal idea. Federalism has been introduced in India not by design or choice—it is by way of continuation of a system which we had inherited from the Government of India Act, 1935.

The Constitution of India established a federation, with powers divided between the Centre and the States. The focus of attention in any federal set up is ensuring unity and at the same time earmarking some powers for the federating units. The Constitution divides and fixes the jurisdiction of both the Centre

*This research work was done under the supervision of Dr. L.S. Rathore, Professor and Head, Department of Political Science, University of Jodhpur, Jodhpur.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

and the state governments and makes them 'autonomous' in their respective spheres of activity. It is a fact that the Indian Constitution assigns to the Centre a larger field of operation for its legislative and executive authority than is to be found in any other federal constitution, so much so that many constitutional experts are inclined to believe that it is a quasi-federal or partly federal arrangement.

The federal device was considered suitable by the framers of Indian Constitution because of the inherent diversifications in the socio, economic and cultural fields. This is a constitutional design where within one sovereign state, national and regional governments are expected to operate with exclusive spheres of powers and functions. The people are placed under dual jurisdiction. It is crystal clear that the national policies and national political parties powerfully influence the form and behaviour of the state systems under a federal polity. It is equally true that the spirit of state politics influences the national politics. The states are also supposed to "serve as trial bases for the integrity of the Indian Constitution and the strength of the Indian democracy."

CENTRALISATION OF POWER UNDER INDIAN FEDERALISM

Our founding fathers were fully aware of India's political history, culture and socio-economic aspirations. They were therefore, determined, as Nehru observed: "not to take any step which might lead towards loosening the fabric of India." Hence, while opting for a federal polity for free India, they did not fail to create a very strong centre, perhaps the strongest in any federal system of the world. The history of India. which is full of fratricidal wars between the regions and communities, was their first major argument for a strong Centre. To a majority of those sitting in the Assembly; it was amply clear that India as a nation had frequently suffered on account of weak centre. The circumstances at the time our Constitution was being framed also persuaded the founding fathers to create a powerful centre. India in 1947-49 was passing through most uncertain times. She was faced with the problems of national security, re-settlement of refugees, communalism, provincialism and accession of Kashmir. To tackle these problems successfully and effectively, India, obviously, needed a strong central government.

Our constitution makers did not fail to learn through the world experience that the whole concept of federalism in the

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

modern world was undergoing a transformation. Centralization had become almost a compulsion. The trend towards the development of a strong and powerful national government was as much pronounced in the United States as in Switzerland and Australia. This new development in the old federations also persuaded the constitution makers to provide for a strong centre. Besides, the makers of the constitution accepted 1935 Act as the model to be followed. And this, to their advantage, provided for a strong centre. Last but not least, the constituent Assembly was dominated by Congress Party which stood for a strong centre.

पुस्तकालय

In our Constitution the Centre has been assigned an extremely important position. The Union List comprising 97 subjects, which are under the exclusive jurisdiction of Union Parliament, has distinct primacy over state list in respect of both size and importance. Art. 248 confides the residuary power exclusively to the Union Parliament. There is a supremacy of Union over State legislation in regard to the Concurrent List. The Constitution also provides for central invasion of State List in special and limited circumstances.

Under emergency provisions of the Constitution, the Centre can arrogate to itself all or any legislative or executive functions of the states. The President's rule tends to shift the balance in favour of the Centre and converts the federal system into a unitary one. This constitutional device, can be used by the Central government to expand its power at the cost of the federating units. Certain state bills have to be reserved for the President's consideration and consent.

The central dominance is no less obvious in the administrative sphere. Art. 256 places a State Government under obligation to so exercise its powers as to ensure compliance with the laws made by Parliament, and to this end the Centre is empowered to issue necessary directives to it. In case of non-compliance by the State Government of central directives, the Centre can resort to the extreme step of taking over the administration of such a state under Article 356. Further, under Article 258 (a), states can be entrusted with central functions and the Union Parliament can impose duties in the central field on State Government.

In an other respect also, the states in the Indian political system are severely handicapped. The Constitution does not protect their identity and integrity. Under Art. 3 of the Constitution, Parliament can by a unilateral action establish new

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

states, increase or decrease the area of any state, alter its boundaries or cause it to disappear by merging it with other states.

The Constitution assignes a sufficiently favourable position to the Centre in matter of finance also. Apart from the fact that taxes under its control are more lucrative, a good many taxes are collected by the Centre and distributed on the recommendation of the Finance Commission (to be appointed by the President at regular intervals) to the States. The Union Government exercises a great influence over the states as their donor. And the predominance of discretionary loans and grants gives the Central government a powerful leverage for influencing the policies and programmes of state governments in spheres which are constitutionally within their competence.

The provisions, dealing with the amendment of the Constitution, also emphasise the supremacy of the Union over the state governments. Many of the important provisions of the Constitution can be amended by Parliament alone like an ordinary law; others can be amended unilaterally by Parliament if two-thirds majorities in both its Houses support the move. It is only in case of few specified provisions that constitutional amendment requires the concurrence of at least half of the states. Besides the states in India have no independent power of constitutional amendment. Even a decision to abolish the state legislative council requires an Act of Parliament.

The Indian Constitution ensures uniformity in such basic matters. It provides for a single judiciary, a single system of civil and criminal laws and procedure and common all India services. Besides, there is a single constitutional framework for the Union and the states. And the states of the Indian Union (except Jammu and Kashmir) have a uniform constitution. Indian Constitution establishes single citizenship.

The strand of central dominance, running throughout the Constitution, weakened the will of the provincial politicians to such an extent that they could take no stand to check even the Centre's inroads in the states jurisdiction.

For many years after becoming independent, the country was ruled by the Congress both at the Centre and in most of the states. The destiny of the entire nation thus lay in the hands of the Congress leadership. This powerful leadership at the Centre not only weakened the will of state governments to champion their cause or rights but also impressed upon them the wisdom

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

to accepting the directions and dictates of the Centre even with regard matters which were within their exclusive control.

Powerful leadership of Pandit Nehru and subsequently of his daughter Mrs. Indira Gandhi also tended to shift the balance of power in favour of the centre.

National Planning also introduced a powerful centralist direction in the centre-state relations. Planning Commission under Nehru emerged as a powerful instrument for centralization, and as such, in the opinion of some critics, the D.D.T. (killer) of federalism.

India's conflict with China in 1962, her wars with Pakistan in 1965 and 1971, as also the debacle of the Congress Party in 1967 — these factors too helped the Centre to grow in power.

The unitarian trends saw an uncommon growth during the Eighteen months of Internal Emergency. After the 42nd Amendment had been enacted, the Centre's control over the states grew tight. It was empowered to supersede an elected state government for one year at one time instead of six months as before. It could right rough shod over the states' legitimate powers. Under the new dispensation, the Centre got the power to deploy central forces without the prior concurrence of state government. The 42nd Amendment, thus established authoritarian regime.

DEMAND FOR AUTONOMY FOR THE STATES : A HISTORICAL PERSPECTIVE

The centre-state relations has passed through various phases. The Indian political party system has been described as a 'one party dominant system'. The one party dominance provided a centralised direction to the Indian polity. The political complexion of the country was metamorphosed after the Fourth General Elections of 1967. The Congress failed to secure absolute majority in many states paving the way for formation of non-Congress governments. However, the party captured power at the Centre with a reduced majority. The changed political scenario was conducive for demanding more autonomy for the federating units.

The initiative for demand of more state autonomy was taken up by the DMK Government of the erstwhile Madras State under the leadership of C.N. Annadurai. The DMK government appointed a committee in 1969 under the chairmanship of Dr. P.V. Rajamannar to go into the question of centre-state

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

relationship and to suggest ways and means as to how the state governments could function more efficiently.

After the 1971 elections, the Congress Party was voted to power at the Centre with overwhelming majority. In most of the states Congress governments were formed after the 1972 elections to the State Legislative Assemblies. The process of centralisation was revived under the leadership of Smt. Indira Gandhi. This process of centralisation culminated in the proclamation of National Energency in June 1975 and the passage of the 42nd Amendment of the Constitution of India later. The Centre-State relationship reverted to the pre-1967 situation of one party dominance.

For the first time a non-Congress government was formed at the Centre after the 1977 elections to the Lok Sabha. This government (Janata Party) at the Centre favoured a strong centre on the plea that any attempt to weaken the centre would jeopardise national integrity.

THE OPPOSITION CONCLAVES : THE RENEWAL OF THE DEMAND FOR STATE AUTONOMY

The demand for more autonomy was renewed after the defeat of the Congress Party in the 1983 Assembly Elections to the States of Andhra Pradesh and Karnataka. In an unprecedented move the Chief Ministers of three Southern States of Andhra Pradesh, Tamil Nadu and Karnataka and the Chief Minister of the Union Territory of Pondicherry took the significant decision of forming the Council of Southern Chief Ministers in a meeting held at Bangalore on 20th March 1983. The meeting demanded changes in the Constitution so that it could give full play to the "new definition of Centre-State relationship and relationship between the States". The Bangalore meeting gave a boost to those who favour greater State autonomy. A Commission was appointed by the Government of India few days after this Conference to examine "the working arrangements between the Centre and the States and recommend such changes in those arrangements as may be appropriate within the present constitutional framework." The Commission is headed by Mr. R.K. Sarkaria.

The Vijaywada conclave, was organised on 28th May 1983. The conclave reiterated the damands for greater state autonomy, review of Centre-State relations and the institution of a fiscal commission to suggest structural changes in the Constitution for transfer of more powers and fiscal resources to the States.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

The New Delhi Conclave (June 1983) which was a continuation of the Vijayawada Conclave adopted resolutions on Punjab tangle, dismissal of Pondicherry Ministry, flood and cyclone havoc in Gujarat and the alleged partisan functioning of the Election Commission.

The Srinagar Conclave of opposition parties from October 5 to 7, 1983 adopted a comprehensive document on Centre-State relations incorporating concrete suggestions for necessary changes in the Constitution. The document expressing its concern over Central encroachment inter alia said :

> Although our Constitution was meant to be a federal one, its unitary features have increasingly come to over shadow its federal features. Over the years, because of the persistence of one party rule both at the Centre as well as the States, the powers vested in the States have been greatly eroded.

The document made an appeal to restore and strengthen the autonomy of the States and to strike a proper balance between the powers of the Centre and those of the States, so that "the character of our multi-religious, multi-lingual and multi-cultural country is preserved."

The Srinagar Conclave suggested many changes in the economic and financial aspects of the Centre-State relations. It recommended reorganisation of the National Development Council and the Planning Commission.

The Calcutta Conclave demanded an immediate review of the Centre-State relations and criticized the statements of the Congress (I) leaders pleading for centralization of powers. The Conclave set up a Drafting committee to prepare resolution on the following issues :

i) the attack on the Andhra Chief Minister, N.T. Rama Rao,

ii) steps to be taken to mobilise the masses on economic issues,

iii) the changes in the procedure of Central assistance to States during natural calamities,

iv) review of the Centre-State relations in the light of the slow progress of the work of the Sarkaria Commission and Centre's efforts to topple the non-Congress (I) Governments.

AREAS OF TENSION

Conflicts in any political system are inevitable, and relations between two levels of the system are bound to manifest tensions at different points. It is diffiult to find any frictionless and

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

tension-free federation in the world. In the Indian political system also Centre-State conflicts continue to arise, and, at times, disturb the harmony of the federal relationship. The major tension areas in the Indian federal set-up are as under :

1. Financial Issues

K. Santhanam, the former Chairman of Finance Commission, described financial relations as 'the Achilles Heel' of every free federation. He also suggested to end the Centre-State conflicts over finance as early as possible. Indeed, ever since the coming into force of the Indian Constitution, its financial provisions have been a subject of severe criticism. The advocates of more funds for the states are critical of the tight control of the Centre over finances. They look upon it as a violation of the federal principles and hold it responsible for the Centre-State conflicts. The backwardness of many states in the Indian Union is also attributed to the faulty distribution of resources. The states' dissatisfaction with the provisions in regard to discretionary grants and loans is, however, much more pronounced. For many of them, to the detriment of others, had been favoured on political grounds during the Congress rule. The Centre-State tension over finance took an ugly shape, when some Chief Ministers of both the Janata and non-Janata governments adopted a posture of open confrontation with the Centre. They did not hesitate to have a resort to extra-constitutional measures to pressurize the Centre for transfer of more funds to the states. Though this move of the state Chief Ministers fizzled out, yet it indicated the extent of tension to which the financial issues could give rise in the context of centre-state relations.

The main complaints of the states in this area are that they do not have adequate resources to meet their commitments of administration and development. The prepondarance of discretionary grants has given the central government a powerful leverage, with the result that the dependence of the states on the centre has considerably increased. And this has, in turn, undermined the states' autonomy. Some other complaints of the state are : the mounting indebtedness of the states is causing a severe strain to them on account of the repayment obligations; the limited role of the Finance Commission is, in no way, in the interests of the states; the receipt of discretionary grants and loans from the Planning Commission, which deals with the bulk of transfers, adversely affects their autonomy; finally, the criteria of transfers, being neither sound nor just, has

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

led to uneven development in the states. Thus the financial issues constitute an area of tension, though they do not pose any immediate problem.

2. Role of the Governor

Our experience with the working of the Indian federal system suggests that the Centre can use the Governors, who are its appointees — for changing the political scons in the states in its favour and for making and unmaking ministries. The difficulty with this office is that the Governor has a dual role. He is the Constitutional head of the state and, at the same time, an agent of the Centre. As agent of the Centre, he is charged with the duty of seeing that the government of a state is carried on in accordance with the provisions of the Constitution. This obligation is imposed on him by oath and also by the fact that he owes a duty to report to the President under Art. 356 if the government of the state cannot be carried on in accordance with the Constitution. Though the Constitution lays emphasis on the Governor's role as Constitutionl head of the state (Art. 154), yet at times his role as agent of the Centre assumes greater prominence. And the person holding the Governor's office fails to remain above suspicion. This, inevitably, causes Centre-State tension.

3. Law, Order and Property

The properties of the Centre and its undertakings are spread all over the country. The Constitution makes the state governments responsible for the maintenance of public order as well as protection of the Central government properties located in the States. Under Art. 256 and 257, the Constitution authorises the centre to give directives to various state governments for the maintenance of conditions that are necessary for uninterrupted functioning of the Central agencies. When state governments fail to effectively safeguard the Central government properties in periods of strife, like strikes, bundhs, gheraos and general lawlessness, the central government rushes the Central Reserve Police or Border Security Force for the purpose. This policy of the central government has evoked bitter criticism in some states on the ground that it is an interference with the state governments' rights.

4. All India Services

The all India services, which are controlled by the Union and

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

which serve the states also, are held to be an unusual feature in a federal set-up. The specific constitutional sanction for the Indian Administrative Service and the Indian Police Service is, in the opinion of the critics, all the more unusual. There is also provision in the Constitution (Art. 312) for the creation of additional all India services and three new services (Indian Forest Service, Indian Engineering Service, Indian Medical Service) have been recently created under this provision. According to Amal Ray "the creation of new all-India services is neither desirable nor practicable. Any attempt to impose them on the recalcitrant states results in further embitterment of Centre-State relations."

5. Planning and Purse

The Planning and Planning Commission also pose an important irritant for the centre-state relations. It is a common complaint of the critics that the states, with their love for autonomy, have to wait on the Centre or the Planning Commission for aid, loans, grants and licences. Planning was originally envisaged as a co-operative activity between the Union and the states. But in actual practice the involvement and participation of the states in the process of planning has steadily blurred the lines of divided jurisdiction in the Indian Federal System and has, in consequence, increased the power of the Centre at the states' expense. Not only that, as a consequence for planning, there has grown a feeling of helplessness in the states even in fields constitutionally allotted to them. This has tended to make them indifferent and irresponsible. Indeed, the Planning Commission, though not a super cabinet, is vital instrument of centralisation.

6. President's Rule (Art. 356)

Art. 356 is meant as a safety valve in the political system to prevent authority vacuum in case of a breakdown of constitutional machinery in a particular state. But our experience with the working of Art. 356 suggests that during the years of one party dominance, Centre has frequently used it as a political weapon to do away with the government not of their choice in the states. And this frequently created tensions between the centre and states.

7. Price and Wage Policy

In our political system, it is the Central government which has complete control over the monetary and fiscal policies and,

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

consequently, over wages and prices too. Comparatively, the states have little control over prices.

8. DISPROPORTIONATE EXPENDITURE

The states have often raised the issue of the disproportionate expenditure of the Centre on subjects like health, education, agriculture which were essentially state subjects. The Centre has a case but the controversy exists. The states have often stated that in all matters like employment, health, price, education, industry, agriculture and law and order, it is the state government which is the target of attack, if there is a dissatisfaction. People hold the state governments responsible for the difficulties and not the Centre which is to them remote.

9. COMMISSIONS OF INQUIRY

The Central government have, at times, appointed commissions of inquiry to examine the charges of corruption levelled against a state government or against the misconduct of Ministers in a state. This action of the Union government has been challenged by the state Chief Ministers.

CONCLUSION

The basic nature of our Constitution was declared to be federal with a pronounced unitary bias. Furthermore, in its actual working it became still more centralized due to the operation of extra-constitutional forces, the need for crisis management and international pressures. The fact that the same political party was in power at the centre and the states for nearly decades facilitated this process. Many of the amendments made to the Constitution deprived the states to a great extent the autonomy they originally had.

The Janata Party Government at the Centre was also not prepared to give greater autonomy to the states. In the multi-party democratic system in India there is every possibility of different parties coming to power in the states. The subject of state autonomy is hotly debated when different political parties rule at the centre and the states.

There has been a mushroom growth of regional parties. The regional political parties which undoubtedly represent a centrifugal force in any federal polity have been responsible for changing the balance of power. The state governments run by regional parties have been more assertive in demanding greater state autonomy. The states which were described by some

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

scholars as administrative units of the Centre became powerful enough to bargain with the Centre. In the name of state autonomy some regional parties have gone to an extreme extent in their demands. In the preceding years the regional parties have taken the initiative of demanding more autonomy for the states with active encouragement and support of some of the national parties.

There are many factors which contributed to the inevitability of centralization. India is a country characterised by territorial, cultural, linguistic, religious, racial and socio-economic diversities. The governance of such a poly-glot becomes difficult because of the ethnic complexity, differences of caste, creed and language and the acute disparities in the living conditions. The compulsions of circumstances, the need for economic and social planning, the logic of welfare state have made the Centre more powerful. From the historical stant-point, whenever there was a weak Centre it culminated in the disintegration of the country. We have also inherited the British legacy of centralized administration. The Constitution of India itself visualised a strong centre and the challenge of times has only made it doubly important. No doubt the states are weaker partners and there is no way out. This is true of other federations also. The federations of the United States, Australia and Canada have been marked by centralization of powers. The centralization of authority is a universal tendency in most of the federal systems of the world. India cannot be an exception to that. The Centre should not be weakened in the existing backdrop of regional aspirations, chaunism, communal tensions, a tendency towards secession and increasing violence in the country. The demand for the separate state of Khalistan, the problems in Kashmir and the troubles is the North East are some of the challenges that the country has to face. The demand that the Centre's jurisdiction must be limited is not acceptable keeping in view the most vital problem of maintaining national unity and integrity.

The demand for greater state autonomy, must have to be examined in its proper perspective. For the smooth functioning of our federal polity we need to accept the path of co-operation but not confrontation between the Centre and the States. The political parties must develop a consensus regarding the Centre-State relationship based on tolerance towards the opposition ruled state governments. The pattern of sharing of resources between the Centre and States is of utmost importance. In the ultimate analysis the nation's strength vis-a-vis other powers of

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

the world is a matter of great concern for all. However, there is the need for greater devolution of economic powers. Too much centralization in the spheres of economic and financial administration has resulted in a system of planning where state priorities are remotely determined. This has led to the economic disparities between different regions of the country. The devolution of economic powers, resources and decision making is the only remedy to the problem of regional imbalance. The spirit of co-operative federalism should be encouraged wherein the states can take initiative in matters of developmental administration with the help of their own resources without too much depending on the Centre. The state governments must be in a position to satisfy the genuine aspirations of the people by implementing their pledges and socio-economic programmes. National and international issues and other policy matters pertaining to crisis-management and maintenance of the polity should be left to the jurisdiction of the Centre and the regional parties or the state governments should not unnecessarily create hurdles for the national government.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

FINANCING ECONOMIC DEVELOPMENT IN INDIA THROUGH DEFICIT FINANCING

MANORMA HUKKU

Abstract of the thesis accepted by the University of Jodhpur
For award of Ph.D. in Economics in the year 1985*

Throughout the period of planned economic development in India one basic problem has been that of mobilisation of resources. Various conventional sources of finance such as taxation, borrowing, foreign grants and foreign loans have been found to be inadequate and hence deficit financing has been resorted to for meeting the resource gap. The idea of resorting to deficit financing for economic development has remained very controversial. Much has been said against it. There are no two opinions regarding the evil consequences of deficit financing when adopted carelessly for capital formation for economic development. But the problem before our country is to choose between the two evils, viz., to adopt deficit financing for capital formation and face inflation or to go without development programmes due to paucity of funds.

Adoption of deficit financing in Indian Economic plans has been largely guided by timely convenience or our helplessness instead of any deliberate and permanent policy. Indian experience of economic development with deficit financing has not been a very happy one, at the same time, one has to confess that it could not have been better without deficit financing due to so many other constraints in the economy. Development with stability is no doubt the ideal state but development with inflation has been often regarded as better than no development at all. It is further established by the fact that while the Planning Commission has time and again spelt out its cautious attitude towards deficit financing in precise terms, it had to, in practice, resort to it in an even increasing measure from plan to plan.

*This research work was done under the supervision of Dr. A. C. Angrish, Professor & Head, Department of Economics, University of Jodhpur.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

Since the period of Third Five Year Plan the planners have always decided to eschew deficit financing to the minimum level at the time of plan formulation but at the end of the plan period it has been observed that reliance on deficit financing had always been much larger. If this wide gap between the intentions and actions for resorting to deficit financing for resource mobilisation is any guide it would be naive to believe that deficit financing could be avoided altogether.

NEED OF THE STUDY

These experiences are indicators of the need for a pragmatic and intensive study of the role of deficit financing in India's economic development. The study calls for a detailed investigation of the need of deficit financing, its boons and curses, its safe limit and limitations of its adoption. It is also essential to assess whether deficit financing alone has been responsible for inflationary conditions in India. If so, what is the correlation between the two. It has been observed that while deficit financing has continued to be a necessary accompanist to the planned economic development in India the price behaviour has not been regular. This fact further stimulates the desire and need to analyse dispassionately and exhaustively the role of deficit financing in India's economic development.

It has been a very coveted subject for scholars to talk about the safe limit of deficit financing. Safe limit of deficit financing can be objectively associated with many factors which vary from time to time. Thus a small dose of deficit financing may be said to have crossed the safe limit at one time in a developing economy under certain circumstances, while under changed circumstances a much heavier dose of deficit financing may be said to be below the safe limit in the same economy.

OBJECTIVES OF THE RESEARCH STUDY

The objective of this research study is to critically examine the role of deficit financing in financing economic development in India. In order to achieve this objective it has been contemplated :

i) to prescribe an acceptable definition of deficit financing in the Indian context,

ii) to examine the relevance of deficit financing as a source of financing India's Five Year Plans in contra-distinction with other methods of mobilising financial resources and their limitation,

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

iii) to justify the rationale and investigate the circumstances under which deficit financing was resorted to for the economic development in India through a planned programme,

iv) to make a critical appraisal of the contributions made by deficit financing for economic development in India with due assessment of its evil influence,

v) to make a rational assessment of the level of deficit financing which can be tolerated.

COVERAGE

The study incorporates relationship of deficit financing with money supply, net national product and price level and invokes discussion regarding the safe limit of deficit financing in the Indian context. The entire plan period has been covered upto the year 1984-85 with the help of the latest available official statistics. Alongwith the study of deficit financing as a source of financing economic development other sources of finance have also been discussed.

SUMMARY AND CONCLUSIONS

Fiscal Policy is a policy of the government through which it seeks to attain certain objectives by adopting fiscal tools like taxation, public borrowing, deficit financing and public expenditure. Objectives of fiscal policy, in general, are maintenance of full employment, equitable distribution of income and wealth and growth with stability.

Fiscal policy has passed through four stages of evolution viz., the Pre-Keynesian Era, Keynes' Fiscal Policy, Post-Keynesian Fiscal Policy and Fiscal Policy for Economic Development.

In developing countries like India the main concern of fiscal policy is with rapid economic development and maximum employment opportunities, equality of income and wealth and price stability. In developing countries fiscal policy helps in rapid capital formation and in proper channelisation of mobilised resources for fast economic development and maximum employment opportunities.

Economic Development is a process whereby the real national income of an economy increases over the long period of time. The classical economists regarded the process of economic development as natural and automatic but this process of economic development is now regarded to be one which is to be achieved through deliberate efforts and which would be elusive without government intervention.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

Capital occupies the central and strategic position in the process of development. Development finance or capital formation depends on resources released domestically and resources transferred from abroad in the form of external loans and grants. As regards domestic sources three approaches for capital formation in a developing country can co-exist. (i) Classical approach holds that savings are the prerequisite of investments and savings—both voluntary and involuntary—should be increased for capital formation. (ii) Keynesian approach holds that savings are determined by investment which can be increased over and above savings by raising finance in the capital market. (iii) The Quantity Theory approach involves inflation and increased savings through creation of money or deficit financing by the government. Financial requirements of a developing country are so enormous that a combination of all the three approaches has to be adopted for rapid capital formation.

Besides domestic sources economic development can be financed through foreign trade and external sources. There is, however, only a limited scope of capital formation through these two sources and domestic resources occupy the most significant position because the ultimate aim of a developing country should be self-reliance.

The term "deficit financing" is used to describe the financing of a deliberately created gap between public revenue and public expenditure or a budgetary deficit, the method of financing resorted to being borrowing of a type that results in a net addition to national outlay or aggregate expenditure. In Western countries all sorts of borrowings by the government are included in deficit financing viz. borrowing from the people, commercial banks and the Central Bank while in India only borrowings from the Central Bank and withdrawals from cash balances by the government are included, which always result in the creation of new money.

Deficit financing has been resorted to in different situations such as war, depression and economic development. Deficit financing has its origin in war financing which is always inflationary because during the war monetary incomes and demand rise with the use of deficit financing while there is a shortage of consumption goods. Use of deficit financing during depression was suggested by Keynes as a technique of compensatory finance for initiating the process of recovery. Use of deficit financing for economic development is of recent origin. Deficit financing helps capital formation for economic development although it is

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

known as the inflationary way of financing economic development.

Success of development programmes depends on adequate financial provision for them. Sources of financing economic development are domestic sources (taxation, public borrowing, government savings and deficit financing) and foreign sources (loans and grants and inflow of private capital for investment). All these sources of finance have their social costs and benefits on the basis of which an upper limit can be determined for every one of them. Since financial requirements are enormous the choice is not between which one is to be used but between the various combinations of all these sources of finance and by applying the Law of Substitution an optimal combination of all the sources of finance can be found out. Due to many practical difficulties only a rough estimate of this optimal combination can be made and often more costly sources of finance have to be adopted.

Taxation is the age old source of government revenue. Besides providing public revenue taxation has many other regulatory objectives like promotion of savings and investment, proper channelisation of investment and reduction of consumption, inequalities of income and wealth and the impact of inflation. In a developing country taxation is the most desirable method of financing public investment but it has a narrow coverage and tax-income ratio is very low due to mass poverty, high propensity to consume, demonstration effect, low taxable capacity and political factors etc. Direct taxes are now very important in a developing country as the revenue from direct taxes is low and and can not be raised much, and they have dis-incentive effect but they are useful and important for reducing economic inequalities. Indirect taxes are better than direct taxes for collection of revenue but indirect taxes are regressive in nature and raise price level in the country. For financing economic development both direct and indirect taxes have to be fully tapped along with other sources of finance. Tax revenue as percentage of national income should be large enough to influence the economic activity in general and the tax system should have the built-in-flexibility.

Public borrowing provides revenue to the government, transfers resources from unproductive to productive uses and reduces purchasing power in the hands of people thereby reducing the impact of inflation. Public borrowing is a better source of finance than taxation. It involves voluntary contribution and the money lent by people is returned with interest. It has no dis-incentive

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

effects. But savings being low due to poverty and rates of interest offered by government being lower than those in the private sector, people are not interested much in lending to the government. Government borrows from the public in two ways—borrowing the small savings of the public and market loans. Borrowing the small savings of the people in the form of issue of bonds and national saving certificates, provident fund deductions and compulsory deposits etc., increases savings in the economy and is anti-inflationary. Market loans are provided mostly by financial institutions which is simply a transfer of financial resources from private to public sector and will not have any anti-inflationary effect.

For rapid capital formation in a developing country domestic savings (corporate, household and government savings) have to be increased. Corporate savings help the development in the private sector. Household savings have special importance in a developing economy for these account for the largest share of total savings. Household savings are low in a developing economy due to poverty, high propensity to consume, existence of large non-monetised sector, lack of banking facilities and demonstration effect etc. Fiscal and monetary measures for increasing household savings can be suggested : Exempting savings from taxation, rapid monetisation, controlling consumption through direct and indirect taxes, redistributing income in favour of savers, attractive borrowing schemes of the government and expansion of banking system especially in the rural sectors.

Public saving is not a very significant source of financing economic development as surpluses from public enterprises are either non-existent, especially in the initial stage of economic development or are very low in a developing economy. This source is better than other sources of finance, hence, efforts should be made to increase the surpluses of the public sector for supplementing other methods of capital formation.

Dependence on external sources of finance, in developing countries, is unavoidable for economic development. Foreign assistance, in any form, should remain only a subordinate source of financing economic development and the ultimate aim should be to become self-sufficient. Among the different types of external sources loans are to be preferred to grants because, inter alia, the former is less tied with foreign political strings. Again among loans multilateral loans, preferably in the form of consortium loans, are considered better than bilateral loan

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

arrangements.

The uncovered gap between the financial needs and the available financial resources has to be met by resorting to deficit financing. Deficit financing provides the government with an additional source of finance which is indispensable in view of the country's limited capacity to save and the pressing need for rapid capital formation.

In an advanced country the use of deficit financing lifts up the economy from slump conditions by increasing investment, output, incomes and employment. Deficit financing in a developing country may lead to inflation because of inelastic nature of supplies. Monetary incomes and demand for consumption goods increase by the use of deficit financing and as the supply of consumption goods cannot be increased at the same rate inflation follows. Deficit financing has been often condemned as an inflationary way of financing economic development which defies its own purpose for which it is used because inflation will retard the process of economic development.

Deficit financing is not always inflationary. When NNP is increasing at a high rate, when non-monetised sector is being monetised, when the habit of cash hoarding increases, when deficit financing is matched by the balance of payments' deficits and when government is able to mop up the additional incomes of the people through taxation and borrowing schemes deficit financing is not inflationary. Thus a properly controlled and efficiently managed programme of deficit financing may not be inflationary and may help economic development.

Mild inflation helps economic development by providing incentive for increasing production. Even the inflationary impact of deficit financing is helpful for economic development to a certain extent under circumstances viz., when it activates the economy, when it leads to rapid capital formation and creation of forced savings. Hence, despite its being prone to inflation deficit financing has to be adopted as a last resort. However, appropriate government policies must accompany the use of deficit financing—taxation and public borrowing should drain off the extra purchasing power in the economy, investments should be channelised in fields of low capital output ratio and quick returns, government must adopt anti-inflationary fiscal and monetary policies, apply policies of physical controls and price controls and deficit financing should be resorted to only as a last resort. In short, government should be vigilant to ensure that deficit financing does not cross the safe limit.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

The concept of the safe limit of deficit financing can be reduced to the age old theory of demand and supply. The safe limit is reached at the point of equilibrium between the demand and supply of money. Factors that increase the demand for money keep the safe limit of deficit financing high, for instance, increase in national product, high rate of monetization in the economy, productive expenditures of the government and deficits in the balance of payments etc. On the other hand the factors that increase the supply of money keep the safe limit of deficit financing low, for instance, the high ratio of deposits to currency, low built-in-flexibility of tax structure, low propensity to save, high velocity of money etc. The safe limit of deficit financing is not a fixed limit and can be raised through proper fiscal and economic anti-inflationary policies.

Huge amount of financial resources—domestic and foreign—are needed for the implementation of the economic plans in India. The analysis of the sources of finance does not show any regular trend in the pattern of financing economic plans in India. There is an apparent adhocism. It has been observed that balances from current revenues and surpluses of public enterprises have sometimes been even negative. Surplus from public enterprises was very insignificant during the First and the Second Plans. Though it has been increasing since then but its contribution to total domestic resources ought to have been much larger. The actuals of surplus from public enterprises and balance from current revenue have mostly been lower than the targets hence reliance on external resources had to be continued and the actual deficit financing had to be more than that envisaged. Deficit financing has been used as the last resort to fill up the deficiency in the total financial resources.

An analysis of the aggregate resources during the planned period reveals that additional taxation and loans from the public have been the two most important sources of finance. The growth of tax revenue reveals about fifty times increase during the planned period. The increase in the revenue from the indirect taxes has been greater than that of direct taxes. High tax rates have had an adverse effect in several ways. Tax evasion has been provoked, saving and investment have stagnated and growth of industrial production and national income has been rendered sluggish. Tax rates have reached a point of saturation. There is a strong need for reducing the rates of taxes—both for direct and indirect taxes. However, there is considerable scope for reducing tax evasion, rationalising tax laws, streamlining tax

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

administration, widening the tax base in the urban sector and tapping the surpluses of the affluent section of the agriculturists.

Financing public investment by mobilising loans from the public is non-inflationary in character because it involves transfer of funds from private to public sector without increasing money supply. Domestic borrowings, largely mobilised through the issue of bonds and securities, have not been very popular among individual investors because of several factors such as under-developed capital market, low saving capacity and lack of attractiveness in the terms of issue, particularly low rate of interest. Market borrowings, without contribution from financial institutions, who have a statutory obligation to do so, will be insignificant. Public borrowings depend on domestic savings. The increasing tax burden has an adverse reaction on household and corporate savings which must be rectified. There is need to revitalize and strengthen the existing machinery for mobilising larger quantum of small savings. Other components of domestic borrowings like State Provident Funds, term loans from financial institutions and miscellaneous capital receipts contribute insignificantly.

The internal public debt has increased by nearly 30 times during 1950-51 to 1983-84 whereas the national income has grown by about 18 times only. Hence, the public debt explosion appears more ferocious. Total payment for interest on internal public debt has increased more than 84 times during the plan period. It used to be 0.8% of the national income in 1950-51 whereas it had risen to 4.1% in 1983-84, a more than five times increase. The internal public debt has reached such heights that it can be said to be feeding on itself. Thus there is not much scope for raising additional resources through public borrowings.

The external assistance in the form of loans and grants is very much needed for the economic development of India. On the one hand it adds to the existing investible resources and on the other hand it brings in the much needed supply of foreign exchange. The balance of payments' difficulties of India are not a temporary phenomenon, hence dependence on external assistance is essential but it is necessary to eliminate it as soon as it is possible. The external assistance has been increasing throughout the period of planned economic development in India. It increased by about 52 times but its percentage share in total plan outlay has been fluctuating. Its share in total plan outlay increased from 9.6% in the First Plan to 35.9% during the three annual plans (1966-69) and thereafter it has been on the decline. Another charac-

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

teristic observed is that the actual assistance has remained less than the targetted amount since the Fourth Plan. The sanctioned amount of foreign assistance could not be fully utilised. The unutilised amount has, therefore, been accumulating for long. The increasing burden of debt servicing and the strings attached to foreign assistance, on account of political and other pressures, limit the dependence on foreign assistance and provide motivation for acquiring self reliance for meeting the financial requirements of economic development.

The budgetary deficits in India have remained a common feature since the days of British rule. Market borrowing and taxation had been the most common form of meeting these deficits. Prior to its application during the period of the Second World War there was no specific policy of deficit financing. Even during the great depression deficit financing was resorted to for filling the revenue gap and not as a deliberately adopted policy of compensatory financing to lift up the economy from the slump.

Deficit Financing in India refers to the creation of new money through borrowing from the Reserve Bank of India and drawing down of cash balances by the Central and the State governments. Whether it took the form of heavy issue of paper currency during the First and the Second World War or net drawing down of cash balances after independence the result remained the same—increasing purchasing power in the hands of the public and the ultimate increase in the price level. Attempts made, from time to time in the pre-independence era, by the government to check the rising price level failed irrespective of the variation in the quantum of deficit financing.

The fall in the price level during the First Plan, despite Rs. 333 crores of deficit financing, could lead to the belief that deficit financing is not always inflationary. This belief was shattered by later experience when the use of deficit financing was followed by a high rate of rise in the price level. It has been established that several factors have contributed to the rising trend of price level in India and deficit financing is not the only culprit.

Opinions differ regarding the utility of deficit financing for economic development in India. It has been used in all the plans with caution but the caution has always failed and deficit financing has always exceeded the pious targets. Thus in the ultimate analysis of the overall situation as experienced during the six plans it can be concluded that deficit financing is indispensable. It has to be tolerated as the necessary accompaniment

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

of the process of economic development in India. However a strict surveillance on its safe limit is essential.

Deficit financing leads to creation of new money but it has been observed that the amount of deficit financing and increase in money supply are not equal because deficit financing is only one factor which influences the money supply. There are other factors also, like credit control policy of the Reserve Bank of India, which influence the money supply.

Through Indian experience during the plan period it has been observed that deficit financing is not inflationary despite an increase in money supply if the increased purchasing power available with the public is taken away by the government through fiscal measures like taxation and public borrowing. Its impact on the price level can also be dampened by the monetisation of the economy and increase in the national production.

As against the general apprehension about the inflationary impact of deficit financing the price level during the First Plan period declined by about 17% despite the actual deficit financing (Rs. 333 crores) exceeding the original target (Rs. 290 crores). The experience of the First Plan also proves that the variation in money supply is not bound to be equal to the amount of deficit financing. Besides, looking to the rate of growth in the First Plan the money supply increased less than its need. Import surpluses together with the increase in the national output brought down the price level despite the use of deficit financing.

Deficit financing had been largely resorted to by withdrawals from cash balances during the first three years of the First Plan and by borrowings of the government from Reserve Bank of India during the last two years. It is significant to note that deficit financing did not follow any regular trend during the First Plan since during the first and the third years of the First Plan there was no deficit financing but surplus. This establishes that deficit financing has been used as a stop gap arrangement—a source of last resort—for financing economic development in India.

The Second Plan, being bolder than the First Plan, needed larger outlay and deficit financing was envisaged to be Rs. 1200 crores. Though this target had to be cut down to Rs. 954 crores in view of the inflationary conditions yet the price level, instead of being controlled, had risen by 34.9% due to various factors such as heavy investment activity for rapid industrialisation and slow increase in agricultural production. Besides, there was a large increase in the bank credit to the private sector, but the

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

rate of growth in NNP was slow.

No regular trend of inter relationship between deficit financing, money supply and price level was observed during the Second Plan. The deficit financing was largely resorted to through the government borrowings from the Reserve Bank of India.

The Third Plan was formulated against the background of severe inflationary conditions and low level of foreign exchange reserves and the scope for deficit financing was low. Exercising great restraint the target of deficit financing for the Third Plan was set at the low level of Rs. 550 crores which was just 7.3% of the total Plan outlay. Unfortunately, due to abnormal circumstances of two severe drought years and two foreign aggressions, both the developmental and non-developmental expenditures had to be increased which could not be met by additional taxation and borrowing and, hence, resort to a much larger deficit financing of Rs. 1133 crores had to be made.

The price level continued to increase but the rate of increase in price level varied from year to year and this variation was not in exact accordance with the variations in money supply or deficit financing. The increase in price level during the Third Plan was 31.8% as against an increase of 34.9% in the Second Plan though the amount of deficit financing in the Second Plan (Rs. 954 crores) was less than that during the Third Plan (Rs. 1133 crores). Thus the trend of inter relationship between deficit financing, money supply and price level had been irregular.

Three annual plans (1966-67 to 1968-69) were carried on with the aim of controlling the price rise which ultimately declined, though insignificantly, in 1968-69. Deficit financing amounted to Rs. 676 crores during the period of three annual plans and had been largely provided by the borrowings of the Central and State governments from the Reserve Bank of India.

A review of the position during the first 18 years of economic planning (1951-52 to 1968-69) reveals that the impact of deficit financing on money supply and prices did not show any regular trend. This, therefore, confirms that deficit financing alone is not responsible for the inflationary trend. There are other factors also that influence money supply and prices, viz. expansionary and contractionary forces (bank credit to commercial sector and time deposits of banks), rate of growth of NNP, withdrawals from the foreign exchange reserves, surplus or deficits in the balance of payments, monetary and credit policies, price policy and fiscal policy of the government.

For financing the plan outlay during the Fourth Plan the

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

original target for deficit financing was set at Rs. 850 crores but the actual amount was Rs. 2060 crores. The government expenditure—both developmental and non-developmental—had been increasing to meet the requirements of development, defence (in the context of Indo-Pak armed conflict in 1971), relief for natural calamities and for refugees from Bangla Desh. The money supply increased by as much as 88% during the Fourth Plan while the rate of growth in NNP was lower, hence, ultimately the price level rose by more than 53%.

Deficit financing which was largely composed of RBI's credit to the Government sector (88%) was shared between the Centre and the States in the ratio of 80 : 20. It would not be desirable to fix the responsibility of an increasing price level on deficit financing alone. The agricultural and industrial production was inadequate to meet the demand for consumer goods, the public distribution system had practically failed and even the strict credit control measures of the Reserve Bank of India had not been fully effective.

The Fifth Five Year Plan commenced in an atmosphere of great strain on the economy which had developed by the end of the Fourth Plan period. The world oil crisis further affected the economy. The outlay for the Fifth Plan was envisaged to be as high as Rs. 39303 crores which was revised to Rs. 40712 crores. This was approximately two and a half times that of the Fourth Plan. In view of the inflationary conditions, the original target for deficit financing during the Fifth Plan was set at Rs. 1354 crores only, contributing 3.4% to the original plan outlay, but as usual it had to be raised to Rs. 3560 crores during the plan period which was more than two and a half times of the target and contributed 9% to the revised outlay. This indicates increased dependence on deficit financing. Centre was again the major contributor of the total deficit financing and about 80% of it was provided by the government borrowing from the Reserve Bank of India.

Money supply during the Fifth Plan increased at a rate higher than that of NNP hence the price level continued to rise. The international inflationary environment added further fuel to fire so much so that despite the credit control, monetary and fiscal measures adopted by the Reserve Bank of India and the government of India to control inflation & black money, the money supply increased by about 59% as against the 27.5% increase in NNP resulting in 33% increase in the price level during the Fifth Plan. Still the relative position was better than that during the Fourth

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

Plan. The fact, that the rate of increase in money supply and price level during the Fifth Plan was lower than that during the Fourth Plan while the amount of deficit financing was 73% higher than that during the Fourth Plan, shows that deficit financing is neither always inflationary nor the only cause of inflation.

The annual plan of 1979-80 was a transient plan brought about by political and economic upheavals. This was a severe drought year and the NNP declined by 5%. Despite the monetary and fiscal anti-inflationary measures deficit financing of Rs. 2655 crores resulted in 15.6% increase in money supply and 17.1% increase in price level.

During the Sixth Plan the target of deficit financing was Rs. 5000 crores but according to revised estimates it was Rs. 12835 crores. For the total outlay of Rs. 111063 crores (R.E.) dependence on deficit financing was 11.5%. The Central government's share in the total budgetary deficit was about 70%. Most of the budgetary deficit was met by borrowing from the RBI. The money supply increased by about 87% while the NNP increased by about 23%. Anti-inflationary strategy was adopted for controlling the aggregate demand through monetary and fiscal measures and for increasing the supply and availability of essential commodities at fair prices through promoting production and expanding the public distribution system. Despite all these measures the price level increased by 55%.

An overall review of the relationship between deficit financing, money supply and price level during the various plans reveal an irregular relationship. The coefficient of correlation between money supply and wholesale price index shows that in the First Plan they were not correlated and gradually the correlation became strong except for annual plans (1966-69) and the Fifth Plan. The coefficient of correlation between deficit financing and money supply and deficit financing and wholesale price index during different plan periods shows no consistent indication of significant correlation. Looking to the significant and increasing use of deficit financing throughout the plan period it can be inferred that the use of deficit financing is unavoidable. However, in view of its inflationary impact a surveillance has to be kept on its safe limit. Safe limit of deficit financing is not a fixed one and can be shifted upward by increasing the NNP and adopting effective fiscal and monetary policies.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

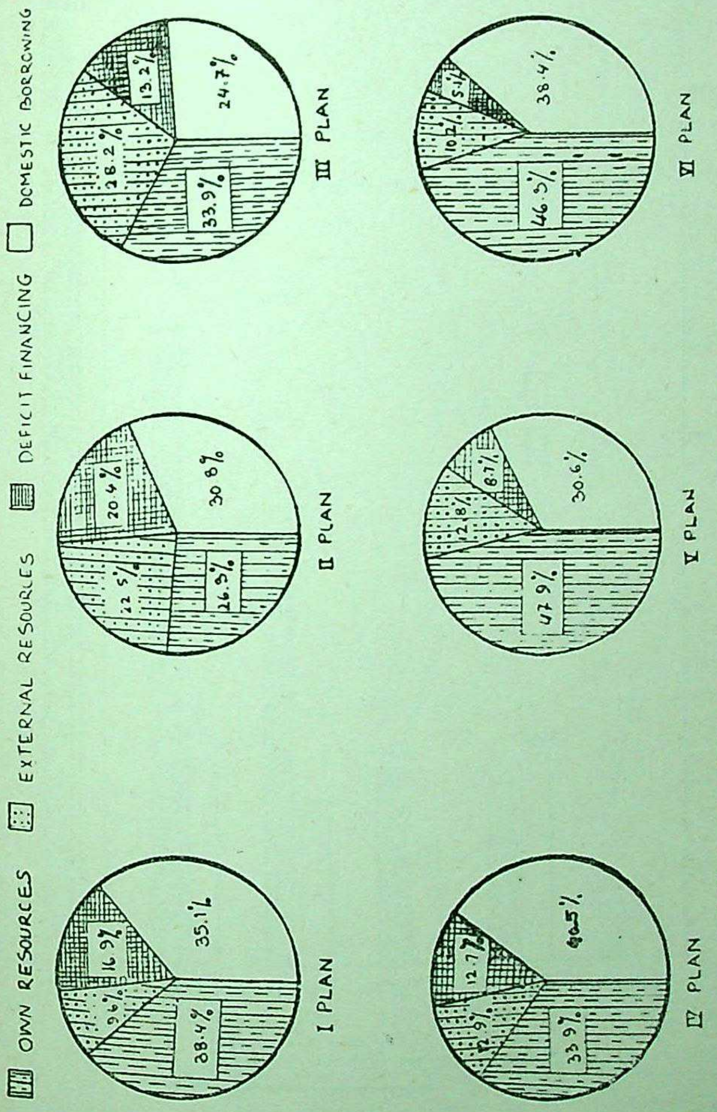


CHART 1 : PATTERN OF FINANCING PUBLIC SECTOR PLANS

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

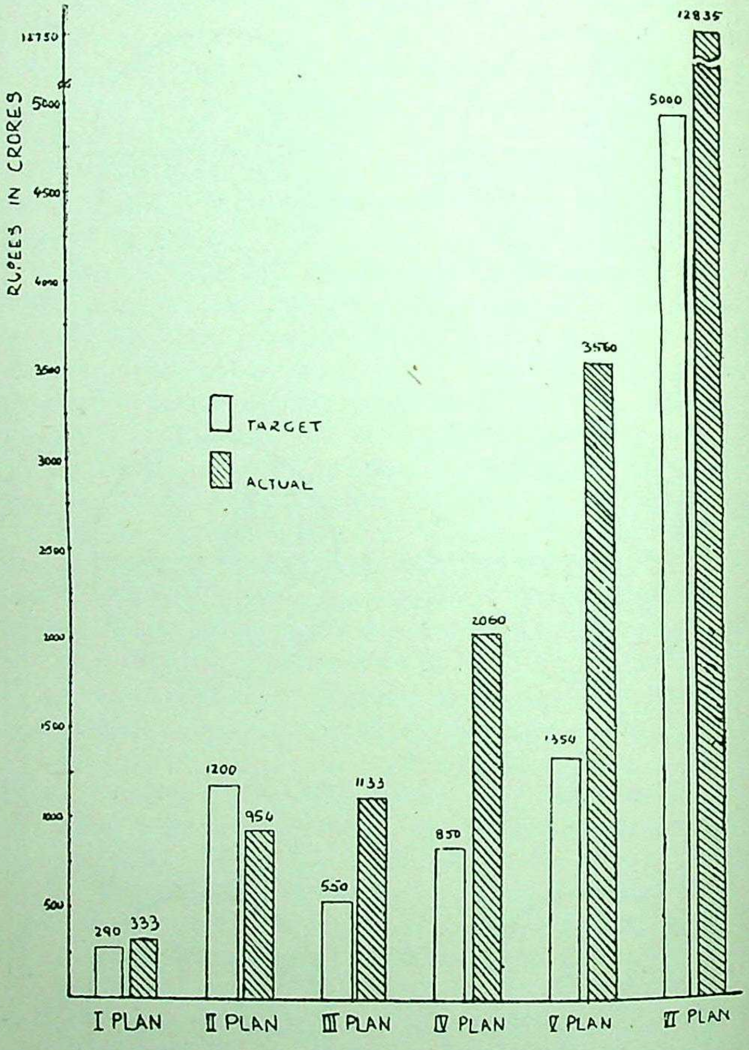


CHART 2 : DEFICIT FINANCING
(TARGETS & ACTUALS)

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

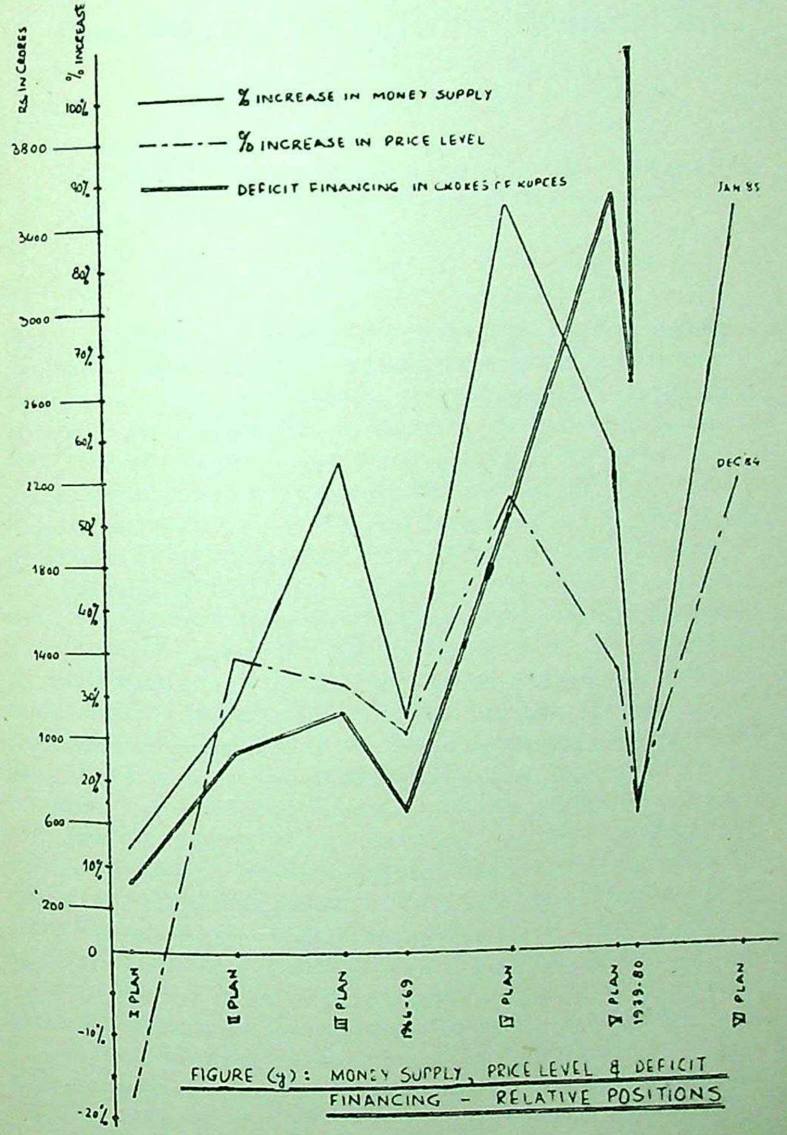


FIGURE (y): MONEY SUPPLY, PRICE LEVEL & DEFICIT FINANCING — RELATIVE POSITIONS

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

ECONOMICS OF MAJOR AGROBASED INDUSTRIES IN INDIA

A Case Study of Cotton Textile Industry of India

PRATIBHA BHARGAVA

Abstract of the thesis accepted by the University of Jodhpur
For award of Ph.D. in Economics in the year 1985*

Agro-based industries form an impotrant part of Indian industrial structure. These industries are vulnerable to the fluctuations in agricultural output as agro-based raw material is the major component of the total material consumed. We have chosen cotton textile industry in India for a detailed study in this thesis.

In Chapter 1, we have given for the purpose of this study a working definition of agro-based industries as those for which percentage of agro-based raw material is 85 per cent or more of the total material consumed. These industries form an important part of total industrial structure in India. The object of the present study is to examine empirically the relationship between the fluctuation in raw material supply and price of raw material, price output and demand for the final product. In this chapter we have briefly examined the variation in output of raw material, price of raw material and price and output of final product for a few industries. This brief analysis indicates a positive relationship between output of raw material and final product and inverse relationship between output of raw material and prices of raw material and final product. This brief analysis only indicates the direction of changes, but the adjustment process will be different in different industries. The extent of impact will depend upon the nature of the commodity used or produced by a particular industry. The appropriate policy will differ from industry to industry depending upon these characteristics. Therefore we need to study these relationships in details so that we can draw some conclusions regarding policy for the industry.

*This research work was done under the supervision of Dr. Vikas S. Chitre, Professor of Economics, Gokhle Institute of Politics and Economics, Pune.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

We have selected cotton textile industry for the detailed study. The basis of our selection was that cotton textile industry has the largest contribution to the output of the manufacturing sector in India.

In Chapter 2, we have described and analysed the growth of the cotton textile industry in India. Cotton textile industry comprises of three sectors, organised mill sector, decentralised handlooms and powerlooms sector and khadi sector. History of the development of industry is divided into three parts. In the first part, we have discussed the growth of the industry upto 1900. The first successful unit in the organised sector was established in 1854. From 1854 to 1900 organised sector was predominantly a spinning sector providing yarn to the handlooms and exporting surplus yarn. In 1900-01 the total production of yarn was 353 million pounds. 173 million pounds were consumed by handlooms and 127 million pounds were exported. The mills' consumption was only 88 million pounds. In the second part, we have discussed growth of the cotton textile industry from 1901 to 1950. During this period, organised sector also started expansion of its weaving side. With the expansion of weaving side, conflict between handlooms and mills came to surface. The share of mills in the consumption of yarn was about 25 per cent in 1900-01. In the year 1913-14 the share of mills and handlooms in the consumption of yarn became almost equal. By 1917-18 the share of handlooms declined further to about 40 per cent of total yarn production. After the end of the first world war in 1917-18, when imports of cloth began to rise domestic production had to face competition with imported cloth. There was persistent demand from industry for protection, industry was granted protection in 1930. The grant of protection stimulated the growth of industry. During second world war, cessation of imports and increased demand for defence requirement provided a good scope for expansion of the industry. Industry was not in a position to increase its production to that extent and there was scarcity of cloth and prices of cloth rose sharply. To check this rise in prices of cloth, controls on production, distribution and prices of cloth and price of cotton were imposed in 1943. During the period after war and beginning of planning in India, there was not much change in the number of units or production of cloth.

Since the beginning of planned development in India, growth of cotton textile industry has been regulated by government. The main features of post independence period of growth are : (1)

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

Faster growth in the number of spinning units and spinning capacity in the organised sector than the growth in the number of weaving units and weaving capacity of the organised sector. (2) There is no growth in the output of cloth in the organised sector after 1956. In fact output of cloth in the organised sector is at a lower level in 1980 than that of 1951 level. (3) Output in decentralised sector has almost increased four fold over the same period. (4) An analysis of categorywise production by organised sector reveals that output of fine and superfine categories of cloth has had a declining trend. Output of coarse cloth also shows a declining trend from 1960 onwards. The growth in output is mainly in medium A category.

One reason for this declining trend in the output of fine and superfine cloth could be government policy on controlled cloth (details are given in Chapter 3). The other reason for this decline could be increasing use of non-cotton fabrics in place of cotton for better quality cloth. (5) Per capita production of cotton cloth has also been declining and in 1980 it was less than that of the level of 1951. The decline in per capita mill production is the natural consequence of the government policy of freezing the weaving capacity of the organised sector. Another reason for the decline in the per capita production of cotton cloth is the increasing use of non-cotton and mixed and blended fabrics. Per capita production of non-cotton and mixed and blended fabrics shows an increasing trend. Our exports in absolute terms and also as proportion of our output show a declining trend.

In Chapter 3, we have discussed and analysed the main problems which the cotton textile industry is facing. The first problem before the industry is the problem of adequate raw material supply at stable prices. An analysis of cotton output for the period 1951 to 1980, shows that almost after every two or three years, we have a year of bad cotton crop. In these years changes in stocks of cotton and imports of cotton had moderated to some extent, the effect of fluctuations in cotton output. Availability of cotton fluctuates less than the output of cotton. Availability of cotton and price of cotton have an inverse relationship. The annual average price index shows large variation around trend. There are wide fluctuations in price of cotton even within a year. We find the price variations are much larger, in the period 1968 to 1980 than the period 1951 to 1967, whether we take the annual prices or monthly price index. The reason for this difference in price variation can be explained in

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

terms of government policy on price regulation. For the period 1951-67 we had the policy of 'Floor' and 'Ceiling' price. The quoted price in the years of scarcity is regulated by ceiling price rather than the true market price. The policy has been substituted by a policy of fixing support price from 1967-68 season.

Apart from the price regulation government has also used regulation of stocks as an instrument for regulating prices. Cotton corporation of India was established in 1971 on the recommendations of Agricultural Prices Commission.

We make an attempt to see the impact of changes in stock in reducing variation in cotton price in Chapter 6, Section 3.4 with our simulation exercise. Our results show that variations in price of cotton would have been much larger in the absence of stocks adjustments.

An analysis of area under cotton, cotton output and yield per hectare shows that in general output of cotton fluctuates with fluctuations in yield. A comparison of the yield in Indian Cotton Mills Federation's cotton development project areas and non-project areas shows that yields can be increased considerably both in irrigated and unirrigated areas.

Government regulations on industry can be classified into two categories. In one group we have included those regulations which aim at protecting decentralised sector. These regulations include, limiting expansion in the weaving side of the organised sector of the industry, reservation of certain items of production for decentralised sector, regulation of production and prices of yarn and differential excise duty on yarn packed in different forms and cloth produced and processed by different sectors. These regulations have benefitted the decentralised sector as can be seen from the tremendous increase in the production of decentralised sector.

In the second category we have included those regulations which aim at providing cloth at reasonable price to the public. Statutory controls on production were imposed in October 1964. Mills were asked to produce a certain proportion of their output of specified varieties and sell it at controlled price. The scheme had the provision of periodical revision of prices to neutralise increase in cost of production. In actual practice price revisions were not allowed from 1968 to 1974. It is agreed even by Bureau of Industrial Costs and Prices that the increase in price of controlled cloth is less than the increase in the cost of production.

The profitability ratio as compiled by RBI shows that profit as ratio to sales is in general less for cotton textile industry than for

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

all other industries. The third problem which the industry is facing is the inadequate modernisation of its plant and machinery. Industry's own resources are not sufficient to meet the requirement of finances for modernization. The soft loan scheme of IDBI has helped the industry in its modernisation programme.

In Chapter 4, we have given definitions of variables used by us in our model and the sources of data used and their limitations.

Chapter 5 presents the simultaneous equation model of the industry. We have specified two alternative hypotheses about the pricing of cotton textiles. One hypothesis is that the cotton textile industry has a competitive market and the second is that cotton textile industry follows a mark up pricing policy. With both these alternative specifications regarding the pricing in the cotton textile industry, we have assumed that there is competitive market for cotton. In our model, domestic demand is explained in terms of price of cotton textiles and personal disposable real income. The price elasticity for demand for cotton textiles is —0.1224. The demand elasticity with respect to income is +0.7421. There is not much difference in the estimates of the parameters of demand function between OLS and TSLS method. Export demand is explained in terms of unit value index relative to our competitors price and aggregate world production of cotton textiles. The export demand is represented by the ratio of our exports to total world trade in cotton textiles. The elasticity of export demand is —0.56 with respect to relative price and elasticity with respect to aggregate world production of cotton textiles is +1.74. The price elasticity of supply of cotton textiles in our competitive market model for cotton textiles is +0.18. Demand for cotton is more elastic with respect to output of cotton textiles than with respect to price of cotton. The price elasticity of demand for cotton is —0.06 and elasticity with respect to output of cotton textiles is +0.79.

Changes in stocks of cotton has very high elasticity with respect to change in price of cotton. The elasticity of changes in stocks with respect to changes in price of cotton is —3.12. Thus with one per cent increase in the change of price of cotton addition to stocks will decrease by 3 per cent.

In the markup pricing model we find that the elasticity of price of cotton textiles with respect to price of cotton and wages is almost same +0.41 and +0.40 respectively.

All our equations satisfy the usual statistical tests. The coefficients in various equations are of correct sign. We have used

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

these models for predicting the values of endogenous variables in our next chapter.

In Chapter 6, Section II we have solved both these model for all endogenous variables given the observed values of our exogenous variables, so that we can see how well our model predicts the path of endogenous variables. The forecasted values of our endogenous variables show relatively small RMSE for demand for cotton textiles, output of cotton textiles and demand for cotton. The RMSE for price of cotton textiles and price of cotton are large as compared to above variables. When TSLS estimates are used to solve the model the RMSE are reduced considerably for these two variables (see Table 6.8). We have chosen markup pricing model for our simulation experiment in Section III. The criterian for choosing markup pricing model was considerable reduction in the RMSE for price of cotton textiles.

As we have already stated in the beginning of our study that the object of this study is to see the impact of fluctuation in cotton availability on price of cotton, price of cotton textiles, output of cotton textiles, stocks of cotton and profitability of the industry. In our simulation experiment we have used controlled values of supply of cotton (defined as domestic production and imports of cotton) with observed values of all other exogenous variables. We are using cotton supply instead of availability of cotton, as availability of cotton is an endogenous variable in our model. In our model output and imports of cotton are exogenous variables. If we take only output of cotton, for our simulation experiment it will mean that we are assuming imports to be same irrespective of the changes in output of cotton, this assumption does not seem to be appropriate. Therefore, we have taken cotton supply as defined above, as the exogenous variable for our simulation experiment.

We have made two experiments. In one experiment we have taken values of supply of cotton when it is assumed to grow at constant percentage rate of growth. In the second experiment we have taken cotton supply when the fluctuations in it around its trend are reduced to half of the observed deviation.

The conclusion which can be drawn from these two experiments are : When deviation in cotton supply around trend in cotton supply are reduced to half the reduction in variability of price of cotton around its trend value is about 25.0 per cent. The reduction in the variability of price of cotton textiles is about 15 per cent. The reduction in the variability of output of cotton textiles

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

is almost nil. Thus contrary to our observation for other agro-based industries discussed in Chapter 1; we find that variability in output of cotton textiles is not influenced by the changes in variability of cotton supply. The reason for this negligible impact on output of cotton textiles is low price elasticity of demand for cotton textiles. Another reason is that a part of reduction in the variability of supply of cotton is absorbed by stocks of cotton. There is a considerable reduction in the variability of changes in stocks of cotton.

When the cotton supply grows at constant percentage rate of growth, we find that the variability in price of cotton is reduced by about 40 per cent and that of price of cotton textiles by about 1/3. In this case the variability of output of cotton textiles instead of a decline shows a slight increase. The reduction in the variability of stocks of cotton is quite significant.

We also tried to see the impact on profits as ratio to sales under certain assumptions. Our index of ratio of profits to sales shows that in most of the years profitability moves in the same direction as output of cotton. The average level of ratio of profits to sales is little higher for our forecast from the model, than the average for our forecast 1 and forecast 2. The variability in profitability is reduced as a consequence of reduction in variability of cotton output, price of cotton and price of cotton textiles.

The results of the exercise in Section 3.4 show that changes in stocks of cotton do help in stabilization of cotton price. The variation in price of cotton is less in the period 1971-80 as compared to the period 1951-70. This reduction in variability is found to be due to both the reduction in variability of cotton output and buffer stock operations by government.

Thus we can conclude that a reduction in the variability of cotton supply would reduce the variability in the price of cotton and that of price of cotton textiles, profitability in the industry, but there would not be much impact on the output of cotton textiles.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

ROYAL PRINCES AND THE LAW OF SUCCESSION IN ANCIENT INDIA

MAHESH CHANDRA JOSHI

Abstract of the thesis accepted by the University of Jodhpur
For award of Ph.D. in History in the year 1985*

The royal princes were one of the most important group of influential personages connected with the administration of the monarchical states in ancient India. As the successor of a ruling king was chosen out of his many sons, virtually the very future of the state depended upon the proper education of the royal princes and the selection of the best out of them as the heir-apparent. Further, the brothers of the reigning king, and also of the heir-apparent, usually rendered much help in running the state administration in the capacity of governors, commanders and other high officers. In theory generally (though not always) the question of succession was solved according to the law of primogeniture. But in actual practice the operation of this rule was not very effective. Firstly this rule, though usually accepted, was quite vague, and the status of the son of a junior queen, if he happened to be the eldest son of the reigning king vis-a-vis a younger son begotten on the senior-most queen was not always clear. Secondly the relative seniority of the queens itself depended upon the favour shown by the king and could change from time to time making the question of the relative seniority of the various princes still more difficult. Thirdly, there were several other factors which could influence the question of succession. For example, the voice of the popular assemblies, the ambitions of the younger brothers, the intrigues of the queens and ministers, the predilection of the ruling monarch in favour of one of his favourite younger sons, the attempts of the feudal lords to get their protege on the throne, all these factors played their role and resulted in court intrigues or actual wars of succession. Therefore, these problems viz. the education of the princes, the role of the princes in running the state

*This research work was done under the supervision of Dr. S.R. Goyal, Professor and Head, Department of History, University of Jodhpur, Jodhpur.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

administration, rules of regal succession and the operation of various factors which determined the question of succession become very important for understanding the political history and administrative organisation of ancient India. But so far no systematic and comprehensive attempt has been made to study these vital aspects of ancient Indian history. We, therefore, hope that our attempt will fulfil this need to some extent.

The present dissertation is expanded into seven chapters besides an introduction, a conclusion and two appendices. Given below is the chapter-wise summary of the thesis.

In the introduction we have discussed the law of primogeniture as it is described in the ancient texts. The subject has nowhere been dealt with systematically in the Vedic or post-Vedic religious or secular literature. The ancient texts bearing on the subject state that in normal circumstances the eldest son of a king should succeed him. The word *jyestha* in the *Rgveda* carries the sense of eldest brother. The word stands for 'the eldest among sons' in other Vedic texts also. It appears from the Vedic evidence that the rights of the eldest son were protected in the Vedic period. However, it is interesting to note that the Brahmanical texts also refer to the instances showing disregard to the law of seniority. Broadly speaking the law of primogeniture is widely supported in the Vedic, Epic and Dharmasastra literature.

We have shown that the law of primogeniture has not been clearly defined in our law books. The seniority of a prince in relation to many other princes born to different wives of the ruler was not easy to determine in the absence of clearly defined norms. Manu, for example, is not consistent in his opinion with regard to the basis of seniority. At one place the seniority of the queen is accepted as the basis of seniority by him, but at another, the birth of the prince is regarded as the determining factor. Another important aspect of the problem was to determine the relative seniority of the queens. The relative seniority of the queens itself depended upon the favour shown by the ruler and could change from time to time making the question of the relative seniority of the various princes still more difficult. The *Sastrakaras* have given conflicting opinions about the basis of seniority of the princes. The definition of the eldest son thus remains controversial. The sovereign ruler's predilection played a significant role in the selection of heir to the throne as is borne out by several examples. Our law books do not treat this aspect of the problem of royal succession and do not specify as to what extent and under what circumstances the law could be ignored by a king. Again there is

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

no mention of the remedial measures should a sovereign ruler chose to violate it. The actual operation of this law was obstructed time and again by various other factors besides the will of the ruling king. The feudal lords, ministers, queens, ambitious princes and court intrigues affected the operation of the law.

The second part of introduction deals with, in brief, the origin and nature of monarchy in ancient India. The origin of kingship has been a subject of controversy among the political thinkers. Almost all the sources speculating on the origin of the state refer to the state of nature. The institution of monarchy originated either from the military needs as is suggested by the famous story of the struggle between the *Devas* and *Asuras* or from the anarchic conditions of society. Similarly, the nature of kingship has given rise to a sharp controversy among scholars. Several allusions to elective kingship in the Vedic literature would support the view that kings were sometimes elected by the people. In such elections probably all the people did not vote. The *Atharvaveda* states that the king to be coronated may be elected by the people. The Buddhist literature also refers to the Bodhisattva as a king elected by the people. The *Mahabharata* also refers to the election of the first king by the people. It may be pointed out here that allusions to hereditary kingship are also not wanting in the Vedic literature. That hereditary kingship was known to the Vedic people is attested by the story of Srnjaya king Dustaritu Paumsayana who is said to have succeeded to a kingdom inherited through ten generations (*dasapurusam rajya*).

There are several instances in the Vedas which go in to prove that monarchy was still not hereditary. But the wholehearted support of the *Visah* to the king-elect and the span of his sovereignty and right to collect revenue and punish those who disregarded the law or royal authority do not certainly testify his dependence on the *rajakrts* or *rajakartarah*. In the present state of our knowledge it appears that the most powerful and war-like senior member of the clan was formally chosen as a king. It seems to us that in certain cases the kings were elected by the people in assembly. But in some other cases kings were merely formally approved by the people.

The first chapter deals with the education of the royal princes. The importance of proper education to the princes cannot be overemphasized. As the successor of the reigning king was chosen from amongst his sons, the very future of the kingdom depended upon the proper education of the royal princes. There

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

is no single comprehensive text describing the details of the training and education given to the princes in ancient India. We have therefore given an outline of the general ancient Indian educational system to provide an idea of the education of the princes. We have discussed the maxims and other reflections, proclaiming the significance of education found scattered in Indian literature. It appears to us that for a long time princes received education with humbler students. The nature of education was predominantly religious and Vedic literature largely constituted the curriculam of the students. Educational instructions were given orally. The learners were to remember the lessons by heart. The *Asramas* of the sages where specialized studies were carried on are known from the remote past as centres of learning. Usually, no formal fees were charged by the sage from his students. The students nevertheless, rendered household services to the teacher. We have discussed the sacraments connected with education in some detail. *Upanayana* marked the beginning of the boy's first lessons in simple living and high thinking irrespective of the status of the family to which he belonged. The chapter also deals with the rules for students, the gurukulas, teacher-taught relationship, subjects of study, learned kings besides the evidence of the Epics, Buddhist literature, *Arthasastra* and others on prince's education and finally the popular literature. It may be pointed out here that all students including the royal princes, had to undergo rigorous training and observe the same mode of life during the course of their studies. We learn from the Jatakas that princes were sent to Taksasila for education from far away places like Varanasi. A Jataka gives us an interesting information about a teacher who had only princes as pupils on its rolls. Kautilya emphatically states that a wicked and unrighteous prince should not be allowed to hold the reins of the kingdom. He has given an elaborate scheme of education of the princes. According to him the prince's education began with tonsure ceremony when he was given instructions in writing and arithmetic (*lipi* and *Samkhya*). The prince was to study after his *Upanayana*, *Trayi* and *Anaviksaki*, *Varta*, *Dandaniti* and *Itihasa*. Manu, Kamandaka and Sukra, besides Kautilya, have emphasized the importance of discipline for the prince.

The role of princes in state administration forms the subject matter of the second chapter. Royal princes were closely associated with the administration of the monarchical states. They also participated in the sacrificial rites related to the *Rajasuya*. In the Vedic age the position of the ruler's son, or brother was second to

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

that of the chief priest. *Rajabhratr* (king's brother) besides king's son has been referred to as one of the eight *Viras* or supporters of the monarchy. We have surveyed the role of the princes in the Vedic age, the Epics, Buddhist and post-Buddhist ages. One of the eighteen *Tirthas* (high officials), alluded to in the *Ramayana*, was undoubtedly *yuvaraja* (crown prince). The *yuvaraja* must have been playing a significant role in the administration, expansion and defence of the frontiers of the kingdom. This is amply corroborated by the Epics according to which the princes used to collaborate in the conquest and aggrandizement of the kingdom. It was undoubtedly in the interest of both the state and the king to enlist the support and co-operation of the princes in the administration of the state. A prince endowed with mere theoretical knowledge of state-craft could not prove a worthy king until he had some empirical experience of administration to his credit. The kings, in order to lessen their own administrative burden on the one hand and impart to princes practical training of administration on the other, sought the help of the latter in the discharge of civil as well as military duties of their office. The royal princes continued to render valuable service to the state in various capacities throughout the post-Buddha period of our history. The princes were appointed as viceroys or governors of provinces or newly conquered territories in the post-Buddha period. This is borne out by many instances. The royal princes also functioned as commanders of the army, regents, administrators, governors and campaign organizers. Our survey of the administrative activities of the princes belonging to the various dynasties includes instances from the South Indian history besides those of the North. It is interesting to note here that the Chola history furnishes rare evidence for the existence of the institution of joint rule. The idea of associating the heir-apparent formally with the king in official administration seems to have been initiated by Rajaraja the Great and not by his son Rajendra I as held by Nilakanta Sastri.

The third chapter deals with the four famous instances of disputed succession from the Vedic age. The Vedic texts allude to the division of property (territory) by Manu among his sons, or property's division by sons during the lifetime of Manu. One of his sons, Nabhanedistha was apparently excluded from the division. We have concluded that Manu had atleast four sons : Nabhanedistha Manava, Saryata Manava, Pururavas and Iksvaku. We have also dealt with the changes the Manu Vaivasvata legend underwent in the Puranas and Epic. Yayati is one of the famous kings of the Vedic tradition. Yayati undergoes total transforma-

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

tion in the later tradition. Yayati begot five sons—Yadu, Turvasu, Druhyu, Anu and Puru. The first two were born to Devayani and the rest to Sarmistha. It is said that Yayati wanted to install his youngest son Puru as his successor superseding the elder princes, who had revolted against or in another version had not obeyed his wishes. Another important instance of the Vedic age is alluded to in a story narrated by Yaska. We are told in the story that Devapi and Santanu, were two sons of Rstisena belonging to the Kuru race. Santanu, the younger brother, occupied the throne. Thereupon Devapi took recourse to penance. The story of Devapi and Santanu is further developed in the Epic and the Puranas. Two reasons are commonly advanced in the Puranas and Epic for the exclusion of Devapi from the kingship - his devotion to asceticism and his being leprous. The fourth instance of the Vedic age is of king Sudasa of the Trtsu branch of the Bharatas. Trtsu king Sudasa's name frequently occurs in the *Rgveda* in connexion with *Dasarajna* and the victory he won against the ten kings. The frequent reference to the battle against the ten kings in the *Rgveda* in general and the Seventh *Mandala* in particular reflects the significance attached to it by the Vedic people. Pratardana Daivodasi is said to have been consecrated by Bharadvaja the hereditary priest of Divodasa. The ambitious prince Sudasa could not tolerate it. He must have been supported by the other disaffected people, specially Vasistha, by whom he was consecrated as the king of the Bharatas. In the fraternal struggle that followed Pratardana was killed and Sudasa became the king of the Bharatas. This reconstruction will also explain as to why Sudasa fought with the Trtsus in the initial stage.

Our reconstruction on the one hand hopefully corrects, some of the imbalances of the Vedic history as it was proposed by Pargiter and on the other, it throws a new light on the actual practice of royal succession which sometimes violated the generally accepted principle of primogeniture.

The fourth chapter deals with the problem of succession in the *Ramayana* and the *Mahabharata*. We have discussed how despite the bride's price promise (which made Bharata the legitimate heir of king Dasaratha) king Dasaratha wanted to appoint his eldest son Rama as his successor in consonance with the time-honoured dynastic norm. We hope that we have thrown new light on the legitimacy of Rama's succession. It has been shown that Bharata's claim to the throne of Ayodhya which emanated from the bride's-price promise, was lost in the *Kopabhavana* of Kaikeyi after the king had disowned the queen and her son Bharata. Similarly, we

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

have critically analysed the data in the *Mahabharata* and shown that Yudhisthira was the legitimate owner of Pandu's kingdom. It has also been argued that Dhrtarastra being unable to reconcile with his exclusion from the throne created the whole confusion by grabbing the throne after Pandu's departure to the forest. Nevertheless, the law of primogeniture is held high in both the Epics.

In the fifth chapter some historical instances upto the time of the imperial Guptas have been discussed. The theory of collective rule under Saisunagas and Nandas is discussed briefly. The problem of succession after Bindusara Maurya is also examined critically. We have shown that emperor Asoka was not the legitimate owner of the crown of the Mauryas. Similarly, various instances in the Gupta dynasty prove that Gupta emperors had little regard for the law of primogeniture.

The sixth chapter deals with some instances of succession in the age of Harsa and post-Harsa period. We have critically examined Bana's testimony in the light of various contemporary evidence and presented a reappraisal of Harsa's succession and personality. We have also discussed in this chapter some instances from the history of the Chaulukyas of Gujarat and shown how the legitimate successors were bypassed. At the end of this chapter we have surveyed the instances from the history of Kasmira. The smooth application of the principle of seniority was frequently obstructed by various factors as is borne out by several other examples.

The ceremonies of royal and imperial consecration form the subject matter of the seventh chapter. We have mainly discussed the *Rajasuya*, the *Vajapeya* and the *Asvamedha* sacrifices.

In the conclusion we have discussed how far the operation of the law of primogeniture was affected by several factors such as the voice of the people, the preference of the reigning king, ambition of other princes, ministers, assemblies, queens, feudatories, military governors, etc.

The institution of diarchy was very popular with the kings of Greek, Parthian and Scythian origin. We have discussed the history and popularity of this institution in detail in Appendix I. Appendix II deals with the succession of a *dauhitra* with special reference to the cases of Rudrasena I Vakataka who is described as *Bhavanaga dauhitra* and of Samudragupta who is called *Lichchhavi dauhitra* in the Gupta inscriptions.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

सर्वोदय का दार्शनिक आधार

कु० चन्द्रकांता व्यास

वर्ष १९८५ में पी-एच० डी० (दर्शन शास्त्र) की उपाधि के लिए जोधपुर विश्वविद्यालय द्वारा स्वीकृत शोध-प्रबन्ध का सारांश*

प्रथम अध्याय

प्रस्तावना

बीसवीं शताब्दी मानव पुरुषार्थ की दृष्टि से विशेष महत्त्व रखती है। इस शताब्दी में मानव ने जितना सहा, जितना अपने हाथों खोया, उतना अब तक के इतिहास में कहीं दिखलाई नहीं देता है। इस काल में सर्वोदय की अपेक्षा से विचार संकल्प और कृतियां अंकुरित हुई, फली-फूली, किन्तु अधिकांशत: मानव जाति सर्वनाश के गर्त के समीप पहुँचती गई।

प्रश्न यह उठता है कि उनकी इस विपरीत उपलब्धि का कारण क्या है? इस प्रश्न का उत्तर प्राप्त करने के लिए इस शताब्दी के आरम्भ से ही खोज चल रही है, परन्तु कोई सन्तोषजनक समाधान नहीं निकला है। द्वितीय महायुद्ध के अणुबम विस्फोट न केवल हिरोशिमा और नागासाकी को आग्नेय स्वाहा करके शान्त हुए, वरन् उन्होंने सम्पूर्ण मानव समाज को असहनीय पीड़ा पहुँचाई और उसकी चेतना को झकझोरा। उसी पीड़ा का प्रभाव क्रांतदर्शी गांधी पर पड़ा और वह मानव को बचाने के लिए उसके प्रेम से प्रेरित हो सामूहिक प्रयास में तल्लीन हो गये। उन्होंने अफ्रीका और भारत में सत्याग्रह के जो प्रयोग किये वे मानव के समग्र उत्थान के लिये थे। उसी समय उन्हें रस्किन की 'अन्टू दिस लास्ट' पुस्तक मिली, जिसका अध्ययन करने के बाद उन्हें लगा कि इस पुस्तक के विचार उनके चिन्तन मनन का ही दर्पण है। उनके विचारों के समान ही रस्किन भी मानते थे कि :

१. व्यक्ति का श्रेय समष्टि के श्रेय में ही निहित है।
२. वकील का काम हो चाहे नाई का, दोनों का मूल्य समान ही है।
३. मजदूर, किसान अथवा कारीगर का जीवन ही सच्चा और सर्वोत्कृष्ट जीवन है।

---

*यह शोध डॉ० (सुश्री) पी० मिश्रा, सह आचार्य, दर्शन विभाग, जोधपुर विश्वविद्यालय, जोधपुर के निर्देशन में किया गया।

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

सर्वोदय से तात्पर्य है सबका उदय, सबका उत्कर्ष, सबका विकास। सर्वोदय का आदर्श है—अद्वैत और उसकी नीति है—समन्वय। मानवकृत विषमता का वह निराकरण करना चाहता हैं और प्राकृतिक विषमता को घटाना चाहता है।

सर्वोदय कोई वाद नहीं है, क्योंकि जीवन और सृष्टि की ओर देखने की हर एक की एक अलग दृष्टि होती है। आज के प्रचलित अर्थ में सर्वोदय विचार मूलरूप से महात्मा गांधी का है, जिसे 'भू दान' के नाम से विनोबा ने व 'सम्पूर्ण क्रान्ति' के नाम से जयप्रकाश नारायण ने समाज के सामने रखा परन्तु मूल रूप से सबका आशय मानव मात्र के उत्थान का ही रहा है। इन सब ने इस विचार को भारतीय परिपेक्ष में व्यावहारिक आधार और स्वरूप प्रदान करने का अनुपम पुरुषार्थ किया और अलग-अलग नाम दिये। क्योंकि इन सब का मूल उद्देश्य मानव मात्र का उदय रहा है अतः इसे किसी एक राष्ट्र की सीमा में नहीं बांधा जा सकता है, इसलिये सर्वोदय का महत्त्व किसी एक राष्ट्र के लिए ही नहीं वरन् सम्पूर्ण विश्व के लिए है। सर्वोदय हो, भूदान हो, या सम्पूर्ण क्रान्ति, ये कोरे शब्द नहीं हैं; इनमें से हर एक का अपना एक ठोस, ऊँचा और गहरा जीवन दर्शन है। जिन्होंने हमें ये शब्द दिए हैं, वे हमारे बीच इन शब्दों को जीकर और इनमें प्राण फूंक कर गए हैं। इसीलिए ये शब्द सार्थक हैं, समर्थ हैं और ज्वलन्त हैं। विलक्षण इनकी शक्ति है, अद्भुत उनका प्रभाव है, ये तो वे शब्द हैं जो व्यर्थ होना नहीं जानते, विफलता को नहीं पहचानते इसीलिये ये सिर्फ शब्द न रहकर मंत्र बन जाते हैं।

इसलिए सर्वोदय एक व्यवहार्य, मध्यममार्गीय सामाजिक आदर्श भी उपस्थित करता है। वह प्रमुख रीति से अहिंसक राज्य है। इस द्वितीय सामाजिक आदर्श में राज्य को रखना मानुषी अपूर्णता के साथ समझौता करना है। सर्वोदय राज्य को अविश्वास की दृष्टि से देखता है, क्योंकि राज्य हिंसा पर आधारित है। सर्वोदय का विश्वास है कि राज्य जनतन्त्रवादी होने के लिये यह आवश्यक है कि नागरिकों में सत्ता के दुरुपयोग का अहिंसक प्रतिरोधहित की सिद्धि के साधनों में से एक हो। अहिंसक राज्य सर्वोच्च सत्ता रखने वाला राज्य नहीं वरन् जनता की सेवा में लगा राज्य होगा। राज्य विकेन्द्रित, जनतन्त्रवादी, ग्रामीण सत्याग्रही समुदायों का संघ होगा। ये समुदाय स्वेच्छा से अपनायी हुई सादगी, निर्धनता और धीमेपन पर आधारित होंगे अर्थात् ये जानबूझ कर जीवन की गति धीमी कर देंगे, और उनमें शक्ति तथा धन की खोज की अपेक्षा आत्माभिव्यक्ति को अधिक महत्त्व देंगे।

सर्वोदय केवल भौतिक उन्नति को ही पर्याप्त नहीं मानता है। वह क्रांति ही क्या, जिसमें मनुष्य की आध्यात्मिक उन्नति न हो? वह क्रान्ति ही क्या जिसमें मानवता का नैतिक स्तर ऊपर न उठे? सर्वोदय का विश्वास कबीर की इस उक्ति में है 'जो तोकूँ कांटा बुवे, ताहि बोइ तू फूल'। पत्थर का उत्तर पत्थर से देने में, अत्याचार का प्रतिकार अत्याचार से करने में, खून के बदले खून बहाने

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

में क्रान्ति नहीं है। क्रान्ति तो है दुश्मन को गले लगाने, अत्याचारी को क्षमा करने और गिरे हुए को ऊपर उठाने में। सर्वोदय क्रान्ति का साधन हृदय परिवर्तन, जीवन शुद्धि, साधन शुद्धि और प्रेम का अधिकतम विस्तार है।

सर्वोदय तत्व दर्शन आध्यात्मिक और भौतिक जीवन में, आदर्श और व्यवहार में तथा व्यक्ति और समाज में एकता स्थापित करता है। यह मानव कल्याण के लिए आधुनिक संसार की सर्वश्रेष्ठ देन है। आज मानव को बचाने के लिये युद्ध का उन्मूलन आवश्यक है। युद्ध के मूल कारण हैं—मनोवैज्ञानिक, समाजशास्त्रीय तथा आर्थिक। इन सबका एक दूसरे से अभिन्न सम्बन्ध है। सर्वोदय इनका उन्मूलन मानव के संत स्वभाव, उसकी एकता तथा सेवा भाव, समूहों तथा राष्ट्रों के पारस्परिक सम्बन्धों में नैतिकता और परिवर्तन की अहिंसात्मक प्रक्रिया द्वारा करता है।

द्वितीय अध्याय

सर्वोदय की परिभाषा व आधार

भारत आध्यात्मिक संतों और महात्माओं का देश है। इस देश के महापुरुषों ने मानव को सत्य और अहिंसा के आधार पर मानवता प्रदान करके उसकी आत्मा में शान्ति की प्रतिष्ठा की है, और इसी की प्राप्ति के लिये उन्होंने अपना समस्त जीवन राष्ट्र व समाज के निमित्त अर्पित किया है जिससे उनका मार्ग सर्वोदय तीर्थ कहलाया।

सर्वोदय शब्द का इतिहास अर्वाचीन नहीं है। इसका उपयोग भगवान महावीर और महात्मा बुद्ध के समय से ही प्राणी मात्र की रक्षा के लिये होता आया है। सर्वोदय एक सहभावना सूचक शब्द है, जिसका अर्थ है—'सर्व प्राणी समभाव'। यह एक राष्ट्र के प्राणियों के जीवन विकास का संकल्प है। प्राचीन भारत में सर्वोदय तीर्थ की प्रवृत्ति के महापुरुष राज्य और सम्पदा के भोगी नहीं होते थे। वे निर्मोही बनकर राज्य सम्पदा के वैभव प्रतिष्ठा आदि से दूर मानव व प्राणीमात्र की सेवा करना चाहते थे। उनकी दृष्टि में राजा और रंक समान थे। उनके हृदय में विशालता थी, विचारों में उदारता।

सर्वोदय तीर्थ को जीवित रखने के लिये भगवान महावीर ने अहिंसा, अपरिग्रह और अनेकान्तवाद जैसे सिद्धान्तों को आधार बनाया और इन्हीं के आधार पर उन्होंने समाज की स्थापना की। 'सर्व' और 'उदय' इन दो संस्कृत शब्दों के समास से 'सर्वोदय' शब्द बना है, जिसका अर्थ है सबका कल्याण— सम्पूर्ण विकास, प्रत्येक का समग्र उत्थान। प्रत्येक में केवल मनुष्य ही नहीं, प्राणी, वनस्पति, सारा जीवनीय वर्ग आ जाता है। वेदों, जैन दर्शन, गीता, उपनिषद, महाभारत में भी यह ही भाव निहित है।

गीता में इसको इस प्रकार व्यक्त किया है—'आत्मवत् सर्वभूतेषु' और 'सर्वभूतहिते रता:'। गांधी का दृढ़ विश्वास था कि व्यक्ति और समाज के

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

जीवन का आधार प्रेम, नैतिक तथा आध्यात्मिक सिद्धान्त नहीं होंगे तो कितने ही उपदेश दिये जायें अथवा शान्ति के लिये कितने ही विश्व संगठन बनाये जायें, युद्ध का कितना ही विरोध किया जाय उससे कोई लाभ नहीं होगा, क्योंकि शान्ति अन्ततः हमारे दैनिक जीवन का ही परिणाम है।

सर्वोदव का आधार सर्वव्यापी प्रेम है, इसलिये इसमें निरपवाद रूप से राजा और रंक, हिन्दू और मुसलमान, छूत और अछूत, काले, गोरे, सन्त और पापी सब के लिये समान स्थान है। किसी भी व्यक्ति या समूह का दमन, शोषण या विनाश नहीं किया जायगा। इस आदर्श समाज व्यवस्था में सब बराबर के सदस्य होंगे, सबको उनकी मेहनत की पैदावार में हिस्सा मिलेगा, बलवान दुर्बलों की रक्षा करेंगे और उनके लिये ट्रस्टी का काम करेंगे तथा प्रत्येक सदस्य सबके कल्याण का ध्यान रखेगा। प्रेम का एक मुख्य लक्षण प्रेम पात्र के लिये आत्म समर्पण करना, सर्वस्व दे देना या मर मिटना है, इसलिए सर्वोदय की सिद्धि के लिये संयम और कष्ट सहना एक मुख्य शर्त है।

गाँधी के जीवन काल में ही विनोबा सर्वोदय-दर्शन के शोधकर्ता और भाष्यकार के रूप में प्रसिद्ध थे। विनोबा ने उस विचार को भारतीय भूमि में एक तात्त्विक और व्यावहारिक आधार और स्वरूप प्रदान करने का अनुपम पुरुषार्थ किया है। जिसका प्रत्यक्ष प्रमाण उनके द्वारा चलाये गये—भूदान, ग्रामदान, सम्पत्तिदान ने भारत की सामाजिक, आर्थिक और सांस्कृतिक व्यवस्थाओं को बदल कर देश में सर्वोदय समाज की स्थापना की।

सर्वोदय के आधार निम्न हैं :

ईश्वर : सर्वोदय विचार का मूल आधार गांधी विनोबा के ईश्वर तथा आत्मा के सम्बन्ध में विचार से है। उनके अनुसार ईश्वर ही परम सत्ता है। विश्व ईश्वर का ही व्यक्त रूप है। वह प्रत्येक मनुष्य व वस्तु में निहित है।

अहिंसा : सर्वोदय समाज का मूल अहिंसा में है जिसके बिना सर्वोदय सत्य व वास्तविक बन नहीं सकता।

विकेन्द्रीकरण : अर्थात् सत्ता का विभाजन। सर्वोदयवादी केन्द्रीकरण के पक्ष में नहीं है क्योंकि इससे शोषण की सम्भावना रहेगी।

ग्राम स्वावलम्बन : सर्वोदयवादियों का इससे यह अभिप्राय है कि सम्पूर्ण समाज में ग्राम अथवा प्रादेशिक इकाइयों के रूप में इस प्रकार की व्यवस्था हो कि ग्रामीणों की सम्पूर्ण आवश्यकताओं की पूर्ति उनके गावों से ही हो जाये।

आर्थिक समानता : प्रत्येक व्यक्ति को इतना द्रव्य मिले कि जिससे उसकी आवश्यकताओं की पूर्ति हो सके।

ट्रस्टीशिप : प्रत्येक व्यक्ति अपनी सम्पत्ति का अपने को ही स्वामी न मानकर एक ट्रस्टी समझे तथा सार्वजनिक हित को ध्यान में रखते हुए ही उसका उपभोग करे।

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

अपरिग्रह : यह नैतिक भावना मनुष्य को अपनी आत्मिक एवं सामाजिक उन्नति करने के लिये त्याग तथा तपस्याओं का उपदेश देता है।

सर्वोदय की दृष्टि में जीवन विज्ञान भी है, कला भी। जीवमात्र के लिये, प्राणीमात्र के लिये समादर, प्रत्येक के प्रति सहानुभूति ही सर्वोदय का मार्ग है। जीवमात्र के लिये सहानुभूति का यह अमृत जब जीवन में प्रवाहित होता है, तो सर्वोदय की लता में सुरभिपूर्ण सुमन खिल उठते हैं।

तृतीय अध्याय

सर्वोदय की दार्शनिक मान्यताएं

इस अध्याय में इस बात का अनुमोदन किया गया है कि सम्पूर्ण मानव जाति को एक मानकर, उसकी सिद्धि के लिये 'मेरा' और 'तेरा', 'मैं' और 'तुम' के भेदभावों का अन्त करना चाहिये। संसार न मिथ्या है, न जीवन दुःखपूर्ण। व्यक्ति को समाज सेवा करते रहना चाहिये। सर्वोदय की कुछ दार्शनिक मान्यताएं हैं जिनके आधार पर एक आदर्श व्यवस्थित समाज की कल्पना की गई है। वे आधार निम्न लिखित हैं :

ईश्वर : ईश्वर प्रत्यय सर्वोदय का केन्द्रबिन्दु रहा है। शेष तत्व इसी केन्द्र के चतुर्दिक विद्यमान हैं। सर्वोदयवादियों को वेद, उपनिषद्, गीता, और वेदान्त सूत्र से प्रेरणा मिली।

धर्म : भारत में धर्म शब्द का प्रयोग बड़े व्यापक अर्थों में किया गया है। धर्म और दर्शन का ही लक्ष्य जीवन का रूपान्तर और सांसारिक दुःखों से मोक्ष है।

जगत विचार : सम्पूर्ण सृष्टि ईश्वर की ही अभिव्यक्ति है। सर्वोदय के अनुसार सारी सृष्टि में उसके विविध रूपों में परमात्मा सर्वत्र व्याप्त है। केवल आँखों से उसको देखने का अभ्यास करना है। इसीलिए उसकी उपासना का सुन्दरतम मार्ग जगत सेवा है। इस प्रकार सर्वोदय विचार में जगत मिथ्या न होकर एक तरह से वास्तविकता है।

सौन्दर्य बोध : जो वस्तु जितनी ही ईश्वर प्रदत्त प्रकृति और ईश्वर अंशस्य मानव के समीप रहेगी, वह उतनी ही अधिक सुन्दर होगी। ईश्वर की अभिव्यक्ति प्राकृतिक सांमजस्य में ही होती है। जहाँ किसी प्रकार का विकार नहीं रहता है और जहां घृणा तथा अशुभ के बदले मानव की साधुता और उसके प्रेम का दर्शन होता है। ईश्वर का दिव्य सांमजस्य मन एवं प्राण को वशीभूत करता है और सौन्दर्य का उद्गम भी यहीं होता है। सर्वोदय ने उन्हीं मानव कृतियों में सौन्दर्य का दर्शन किया है।

मानव और उसका स्वभाव : मानव भी परमात्मा का एक रूप है क्योंकि वह सृष्टि का एक अंश है। प्रत्येक व्यक्ति में दैवी प्रकाश समान मात्रा में उपस्थित है। कोई महात्मा है और कोई अल्पात्मा, यह कोरी उपमा है।

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

वास्तव में तो आत्मा ही है। आत्मा न महान् होती है और न अल्प। जहां उसके गुण का प्रकाश ज्यादा पड़ा वहां महात्मा की उपमा दी जाती है।

अमरता : सर्वोदयी आत्मा की अमरता तथा आवागमन के सिद्धान्त में विश्वास करते हैं। अतः मृत्यु के भय को निराधार मानते हैं। उनके अनुसार जैसे नींद जरूरी है, वैसे मृत्यु भी जरूरी है। नींद से उठकर फिर हम अपना काम आरम्भ कर देते हैं ठीक उसी प्रकार मरने के बाद भी पहले की यह सारी साधना हमारे काम आ जाती है।

जीवन का लक्ष्य : जीवन में उचित लक्ष्य का होना बहुत ही महत्त्वपूर्ण है। हिन्दू दर्शन के अनुसार जीवन का सर्वोच्च लक्ष्य 'मोक्ष' है। सर्वोदय भी 'मोक्ष' को जीवन का सबसे बड़ा 'फल' मानता है। उसके अनुसार आसक्ति, क्रोध, वासना तथा अविद्या से मुक्ति ही मोक्ष है।

संकल्प-स्वातंत्र्य : मानव स्वातंत्र्य का प्रश्न दर्शनशास्त्र की प्रधान समस्याओं में है, भारतीय दर्शन में इसका सम्बन्ध कर्म सिद्धान्त के साथ है जिसमें पूर्व जन्म का विचार भी सम्मिलित हो जाता है। सर्वोदय विचार की ये आधारभूत दार्शनिक मान्यताएं हैं। इनका कोई विरोध आधुनिक विज्ञान से नहीं है। विश्व में सम्पूर्ण मानव जाति की एकता को मानकर उसकी सिद्धि के लिए पूरे प्रयत्न करने चाहिये और सभी प्रकार के यहां तक कि 'मेरा और तेरा' 'मैं और तुम' के भेदभाव का अन्त करना चाहिए। संसार को न तो मिथ्या मानना चाहिये और न जीवन को दुःखपूर्ण।

चतुर्थ अध्याय

सर्वोदय का आध्यात्मिक आधार

आज के युग में दो प्रमुख सभ्यताएं हैं, वे हैं पूर्व और पश्चिम की सभ्यताएं। पूर्व और पश्चिम दोनों सम्पन्न जीवन के लिये एक दूसरे के याचक हैं। पूर्व आध्यात्मिक प्रधान है, जब कि पश्चिम विज्ञान प्रधान है। अर्थात् सम्पन्न जीवन के लिये दोनों का सहयोग होना आवश्यक है।

सर्वोदय में दोनों का समन्वय किया गया है। सर्वोदय मानता है कि मनुष्य केवल भौतिक या केवल आध्यात्मिक नहीं है, मानव कल्याण के लिये दोनों का होना आवश्यक है, अर्थात् एक आँख है, दूसरा पाँव। जिस तरह यह दोनों अंग पूरे शरीर के सन्तुलन को बनाये रखते हैं ठीक उसी प्रकार सम्पूर्ण मानव कल्याण के लिये आध्यात्मक 'आँख और विज्ञान 'पाँव' है, जिसने विश्व रूपी शरीर का संतुलन बनाये रखा है।

आध्यात्मिकता का अर्थ है परिपूर्ण व समन्वय। आध्यात्मिक जीवन ही मानव की अन्तिम परिणति है। साथ ही आध्यात्मिक जीवन मानव जीवन की अस्वीकृति में नहीं उसकी स्वीकृति एवं पूर्णता में है। आध्यात्मिक मनुष्य ही विश्व बन्धुत्व के आदर्श को सम्यक् शील में परिवर्तित कर सकता है, जनमानस

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

का संवर्धन करने में उसे विश्व मानवता के प्रति श्रद्धा है।

सर्वोदय का मत है, समस्त मनुष्य जाति एक है। मनुष्य सार रूप में एक ही है। उनमें सांस्कृतिक समन्वय सम्भव है। सभी देशों को एकता के मूल में गूंथा जा सकता है। मनुष्यों को उनके स्वाभाविक रूप में न देखकर उनमें वर्ग, देश, जाति का भेद देखना वैसा ही है जैसा कि एक ही व्यक्ति को उसके भिन्न नामों और कार्यों के कारण विभिन्न व्यक्तियों में बांट देना। सभी मनुष्यों की शारीरिक और आत्मिक आवश्यकताएं समान हैं। सर्वोदय में सभी धर्मों का समावेश किया गया है। सर्वोदय ने कहा है कि सभी धर्मों का मूल एक ही है, उस तक पहुँचने का साधन अलग-अलग है। धर्म शाब्दिक अर्थ में एकता और सामन्जस्य का तत्व है। इस प्रकार धर्म मानव और ईश्वर, असीम और ससीम की परम एकता में आस्था पर आधारित है।

दर्शन, धर्म और विज्ञान : सर्वोदय के अनुसार ये तीनों एक दूसरे के सहयोगी हैं, इन तीनों के सहयोग से ही मानव का कल्याण होगा, उदय होगा। सर्वोदय की मान्यता है कि मानव ज्ञान की प्रत्येक शाखा के अपने तर्क, अपने गुण और अपना कार्य क्षेत्र होता है और प्रत्येक ही मानव ज्ञान के द्वन्द्वात्मक विकास में सहायक है। भारतीय धर्म गहन और व्यापक है उसका आधार-तत्व चेतना का सत्य है और उसका लक्ष्य मानव आकांक्षी है। धर्म का लक्ष्य आध्यात्मिक जाग्रति है, जो सचमुच ही, जाति, स्वीकृत मत, सम्पत्ति और शक्ति के इन्द्रजाल से मुक्त है।

अन्त में सर्वोदय के अनुसार धर्म सत्य का अन्तर्दर्शन है, वह किसी मत या नियम संहिता का नाम नहीं है। वह आन्तरिक चेतना का जीवन है जो विवेक सम्मत विचार, सफल कर्म और उचित सामाजिक संस्थाओं द्वारा अवश्य ही व्यक्त होता है। ऐसा धर्म व्यापक धर्म है। वह सभी का है। किसी विशिष्ट मत, सम्प्रदाय या जाति का नहीं है। वह हिन्दू, बौद्ध, ईसाई या पारसी धर्म का सूचक न होकर धर्मों के अन्तरतम सत्य का द्योतक है।

पञ्चम अध्याय

सर्वोदय का नैतिक सिद्धान्त

नैतिकता हमारे अन्दर संघर्ष और संहार की भावनाओं और प्रवृतियों को परिवर्तित करके परोपकार, शान्ति, सुख और सामन्जस्य को प्रोत्साहित करती है, अतः नैतिकता का सबसे अधिक अति जीवित मूल्य है। मानव विकास की दीर्घ प्रक्रिया में यह धीरे-धीरे विकसित होती गई इसीलिये मानव के लिये अधिक से अधिक लाभप्रद सिद्ध होती गई है। आज यह मानव प्रकृति का एक अभिन्न अंग बन गई है।

सर्वोदय के अनुसार एक आदर्श समाज नैतिक व्यवस्था द्वारा ही सम्भव है। सत्य और प्रेम को जीवन सिक्के के दो पहलू मानने में अति भौतिक और

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

नैतिक दोनों दृष्टियां संवादिनी हैं। यही कारण है कि आध्यात्म और नीति सर्वोदय के लिये लगभग एक ही आशय व्यक्त करते हैं। दैनिक व्यवहारों को नैतिक मूल्यों पर चलाकर ही आध्यात्म का व्यापक लक्ष्य प्राप्त किया जा सकता है। अर्थात् सर्वोदय का नीति मूल्य आध्यात्म में निहित अति भौतिक तथ्यों पर आधारित है। हमें अच्छा नैतिक व्यवहार क्यों करना चाहिये ? इस प्रश्न का समाधान न तो प्रबुद्ध स्वार्थवादियों के पास है और न मानवतावादियों के तर्कों में वरन् आध्यात्मिकता में निहित है अर्थात् जीवन की एकता का साक्षात्कार ही मानव को नैतिक बना देता है। सर्वोदय का विश्वास न केवल मानव सृष्टि, बल्कि सम्पूर्ण जीव सृष्टि की एकता में है। मनुष्य को नैतिक व्यवहार की प्रेरणा सत्ता, सम्पत्ति और प्रतिष्ठा की प्रेरणा से नहीं, प्रेम और सामाजिकता की सहज प्रेरणाओं से ही मिलती है। इसी कारण वह दूसरों के लिए जी जान से काम करता है, क्योंकि पड़ौसी की भलाई में वह अपनी भलाई देखता है। स्वार्थ को व्यापक बनाना ही निःस्वार्थता है। यही सर्वोदय का मूल लक्ष्य है।

गांधी ने धर्म और नैतिकता को एक दूसरे का पर्यायवाची माना है। इसको उन्होंने बहुत ही सुन्दर शब्दों में स्पष्ट किया है—"सच्चा धर्म एवं सच्ची नैतिकता एक दूसरे से अविच्छेद् भाव से आबद्ध है। धर्म का नैतिकता से वही सम्बन्ध है जो जल का भूमि में बोये हुए बीज से है।"

सर्वोदय में नैतिकता और धर्म की समस्याओं को तीन श्रेणियों में विभाजित किया गया है। वस्तुगत नैतिकता, आत्मगत नैतिकता, परमार्थिक नैतिकता। तीनों प्रकार के सिद्धान्तों के तीन आधार हैं। वस्तुगत नैतिकता का अध्ययन बाह्य नियम संहिताओं के आधार पर कर्मों के औचित्य-अनौचित्य के निर्धारण की दृष्टि से किया गया है। आत्मगत नैतिकता का आधार मनोवैज्ञानिक है। इसमें मानव की आन्तरिक प्रवृतियों और निवृतियों के आधार पर किसी कार्य के औचित्य-अनौचित्य का निर्धारण होता है। परमार्थिक नैतिकता का अध्ययन मोक्ष और उसके साधन के विचार से किया गया है।

सर्वोदय का मुख्य विषय केवल नैतिक प्रत्ययों और वाक्यों का प्रमाणीकरण ढूंढना नहीं वरन् नैतिक कर्ता को उचित निर्देशन करना है। जिससे प्रत्येक व्यक्ति अपने व्यक्तित्व का सर्वांगीण विकास कर सके।

षष्ट अध्याय

अहिंसक क्रान्ति की प्रक्रिया

आज के वैज्ञानिक युग में मनुष्य को विनाश से बचाने का एक मात्र उपाय अंहिसक क्रान्ति ही है।

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

"क्रान्ति का अर्थ विध्वन्स नहीं, बल्कि परिवर्तन है।" मूल्य या विचार डण्डे के जोर से नहीं बदले जा सकते, उनको तो शान्तिमय तरीके से ही बदला जा सकता है।

क्रान्ति के प्रमुख कारण निम्नलिखित हैं—सामाजिक असन्तोष, राजनैतिक दमन, आध्यात्मिक असन्तोष, एवं भ्रष्टाचार।

सर्वोदयवादियों ने क्रान्ति के निम्न तत्त्व बताये हैं :

हृदय परिवर्तन : सामान्यतः हृदय परिवर्तन का सम्बन्ध उन सार्वेगिक घटनाओं से है जो व्यक्ति के जीवन-दर्शन में एकाएक पूर्ण और सर्वांगीण परिवर्तन करती है। चम्बल के डाकुओं का विनोबा और जयप्रकाश के सामने आत्म-समर्पण ये सब हृदय परिवर्तन के उदाहरण हैं।

विचार परिवर्तन : हृदय परिवर्तन की पहली आवश्यक भूमिका है—विचार-परिवर्तन। विचार परिवर्तन के कारण ही मनुष्य का हृदय परिवर्तन होता है। अतएव करुणा के द्वारा क्रान्ति लाने के लिए गांधी व विनोबा ने इसको आवश्यक माना है। विश्व में जितनी भी क्रान्तियां हुई हैं चाहे वे हिंसक हो या अहिंसक, उनके पीछे विचार और विचार-तंत्र का प्रबल योगदान रहा है।

स्थिति परिवर्तन : हृदय परिवर्तन और विचार परिवर्तन एक प्रकार से स्थिति परिवर्तन की आवश्यक भूमिकाएं है। अर्थात् विचार परिवर्तन द्वारा हृदय परिवर्तन, हृदय परिवर्तन के द्वारा जीवन परिवर्तन और जीवन परिवर्तन के द्वारा समाज परिवर्तन ही क्रान्ति की प्रक्रिया होगी।

अहिंसक क्रान्ति की प्रक्रिया : अहिंसक क्रांति का अर्थ निरपवाद रूप में सर्वत्र सुख ही सुख हो। जो लोग समाज को दो वर्गों में बांट देना चाहते हैं वे अपने को 'साम्यवादी' या और कुछ 'वादी' कह सकते हैं, परन्तु वे 'सम्प्रदायवादी' के सिवाय कुछ नहीं। जहाँ पाश्चात्य में मस्तिक को अधिक से अधिक भलाई की दृष्टि से सोचने की शिक्षा दी जाती है, वहां भारतीय मानव को बचपन से ही सबके भले का, विश्व मैत्री का, 'वसुधैव कुटुम्बकम्' का विचार करने की शिक्षा दी जाती है। सर्वोदय समाज का कायापलट इसी 'आत्मोपम्य' के आधार पर करना चाहता है जिसमें दूसरों को कष्ट पहुँचाये बिना लक्ष्य सिद्धि होगी। यह अहिंसक क्रान्ति द्वारा ही सम्भव है। अहिंसक क्रान्ति की प्रक्रिया में निम्न तीन बातें प्रमुख हैं :

१. समझने-समझाने का पूरा प्रयत्न
२. आत्मशुद्धि
३. सक्रिय आन्दोलन।

मान्यता, आकांक्षा और जीवन के मूल्यों में आधारभूत परिवर्तन करना है। बल प्रयोग द्वारा नहीं क्योंकि जितना बल प्रयोग होगा, उतनी ही अधिक विपरीत प्रतिक्रिया होगी, जिससे हमारी मान्यता परिवर्तित नहीं होगी।

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

मान्यता विचारों से बदलती है, बन्दूकों से नहीं। इस प्रकार अहिंसक क्रान्ति समझने-समझाने की क्रान्ति है। इसी को विचार-शासन कहते हैं। आज विश्व को अहिंसक क्रान्ति की आवश्यकता है, हिंसक क्रान्ति से मानव भयभीत हो गया है। अहिंसक क्रांन्ति से ही विश्व का कल्याण होगा।

सप्तम अध्याय

भूदान तथा ग्रामदान

आज विश्व के सम्मुख जो समस्या है वह है अन्यायपूर्ण भूमि व्यवस्था की। जिसने चारों ओर अशान्ति फैला दी है। सर्वोदय का मूल लक्ष्य सब का उदय, सबका कल्याण करने से है। यह तब तक नहीं हो सकता जब तक भूमि की समस्या हल नहीं हो जाती। विनोबा व जयप्रकाश ने इस लक्ष्य को भू-दान, ग्रामदान आन्दोलन द्वारा पूरा करने का प्रयास किया, जिसमें उन्होंने सफलता भी प्राप्त की। उन्होंने इसको प्रयोग रूप में भारत में प्रारम्भ किया क्योंकि यहां की ७० प्रतिशत जनता कृषि पर निर्भर है। परन्तु इसका यह अर्थ नहीं कि भू-दान, ग्रामदान केवल भारत की सीमाओं में ही महत्त्वपूर्ण है वरन् समस्त विश्व के लिये भी इसका महत्त्व है। विनोबा बहुत ही सरल व सुन्दर शब्दों में इसे स्पष्ट करते हैं कि विज्ञान की उन्नति के कारण लड़ाई का तरीका अब व्यावहारिक नहीं रह गया है युद्ध के शस्त्र अत्यन्त भयंकर हो जाने के कारण मनुष्य ने महसूस किया कि युद्ध और विश्व साथ-साथ नहीं चल सकते। इस विज्ञान के युग में अगर युद्ध चलेगा तो विश्व नहीं रहेगा, और विश्व को रखना है तो युद्ध की जड़ को खोजना होगा। विनोबा 'यथा पिण्डे तथा ब्रह्माण्डे' की कहावत द्वारा सिद्ध करते हैं कि गांव-गांव में लड़ाई की जड़ जहां है, वही ब्रह्माण्ड में भी है। सभी लोग जानते हैं कि किसानों की जमीन के बीच जो मेड है, वही युद्ध की जड़ है। जैसे दो किसानों के बीच की मेड़ पर युद्ध होता है, उसी तरह दो राष्ट्रों के मध्य युद्ध अधिकांशत: उसकी सीमा रेखा के कारण ही होता है। इसीलिए विनोबा ने भू-दान एवं ग्रामदान से गांव की बाड़ तोड़ने की तथा 'जय जगत्' के नारे से राष्ट्रों के मध्य की दीवार तोड़ने का प्रयास किया है। आज के तूफानी युग में यह दीवार तोड़ने का कार्यक्रम जब तक तूफानी गति से आगे नहीं बढेगा तब तक विश्व जिस द्रुत गति से विनाश की ओर जा रहा है, वह एक नहीं हो सकेगा। विनोबा ने तूफान को रोकने की विधि 'ग्रामदान' तूफान का आवहान किया है। उन्होंने सिद्ध कर दिखाया कि तेलंगाना में भूमि को लेकर हिंसा फैल रही थी जिसे सरकार के कानून, योजनायें तो क्या बन्दूकें भी रोक नहीं सकी। वहां विनोबा के अहिंसात्मक शंखनाद और भू-दान के आयोजन से शान्ति स्थापित की गई। भूमि के स्वामियों ने सहर्ष भूमि दान में दी। विनोबा ने कहा कि भू-दान तक ही यह आन्दोलन सीमित नहीं रहा, भू-दान से ग्रामदान, ग्रामदान

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

से जिलादान, जिला से राष्ट्र और राष्ट्र से विश्व दान होना भी असम्भव नहीं है अर्थात् समस्त विश्व एक कुटुम्ब के रूप में एक सूत्र में बंध जायेगा।

भू-दान का शाब्दिक अर्थ है स्वेच्छा से भूमि को दान में देना। भू-दान यज्ञ का बीज तत्व गांधी के ट्रस्टीशिप के सिद्धान्त में है तथा उनकी इन उक्तियों में भी अन्तर्भूत मालूम पड़ता है कि सच्चा समाजवाद तो हमें अपने पूर्वजों से प्राप्त हुआ है, जो हमें यह बताते हैं कि 'सबै भूमि गोपाल की' इसमें कहीं 'मेरी' और 'तेरी' की सीमाएं नहीं हैं। ये सीमाएं मनुष्यकृत हैं जिन्हें तोड़ा जा सकता है।

ग्रामदान भू-दान आन्दोलन का ही अन्तिम चरण है, जिसमें केवल भूमिहीनों के लिये भूमिदान की ही कल्पना नहीं है वरन् इसमें भूमि के सम्पूर्ण मिलकियत को समाज या गांव को सौंप कर सेवावृति अपनाने का विचार है। भू-दान में वस्तुत: भूमिहीनों की समस्या के समाधान का विचार है। परन्तु ग्रामदान एक पूर्ण विचार है और गांधी के राम राज्य अथवा ग्राम स्वराज्य की कल्पना का आधार स्तम्भ है।

ग्रामदान एक नैतिक विचार है। भूमि और संपत्ति की मिलकियत समाप्त होते ही समाज से झगड़े-फसाद, मुकद्दमे, चोरी, डकैती आदि बुरे आचरण समाप्त हो जायेंगे। ग्रामदान के द्वारा 'सरकार के दमनतंत्र', 'पूँजी के शोषण' और 'बन्दूक के दमन' तीनों से मुक्ति का मार्ग खुल जाता है।

आज भू-दान-ग्रामदान क्रांति का केन्द्र भारत ही है, लेकिन इसकी परिधि पूरा मानव समाज है। इसके प्रयोग से भारत ही लाभान्वित होगा ऐसी बात नहीं, यह मानव विश्व के लिये मार्ग-दर्शन दीप बनेगा। भू-दान में "ग्राम स्वराज्य" और "जय जगत" रूपेण आदर्श निहित हैं।

अष्टम अध्याय

उपसंहार

यद्यपि सर्वोदय पूर्ण व व्यावहारिक विचार है दरन्तु कुछ सिद्धांतवादियों ने इसकी कड़ी आलोचना करते हुए इसकी व्यावहारिकता के संदर्भ में संदेह व्यक्त किया है। उनके अनुसार सर्वोदय आदर्श तो हो सकता है, परन्तु व्यवहार में उसका विनियोग कदापि संभव नहीं है। दूसरी ओर सर्वोदयवादियों के अनुसार सर्वोदय का आदर्श ऊँचा है तथा यह प्राप्य साध्य तथा प्रयत्नसहाय है। शक्ति का विकेन्द्रीकरण तथा अहिंसात्मक प्रवृत्ति की सर्वोदय धारण को भी आलोचना का विषय बनाया गया है परन्तु ज्यों-ज्यों अहिंसा का विश्वीकरण हो रहा है त्यों-त्यों अहिंसात्मक प्रतिकार का उपयोग बढ़ रहा है तथा विश्व नागरिकता,

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

विश्व धर्म एवं विश्व राज्य की पनपती भावना के साथ-साथ सर्वोदय का भविष्य उज्ज्वलता की ओर अग्रसर हो रहा है।

अतः सर्वोदय को अव्यावहारिक मानकर इसे अग्राह्य घोषित करना मानव को ऐसे दर्शन से वंचित करना होगा जिसकी की उसे आज अत्यंत आवश्यकता है।

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

SIGNIFICANCE OF GEOMORPHOLOGY IN SPATIAL PLANNING OF AN ARID ENVIRONMENT—A CASE STUDY OF JODHPUR DISTRICT

SURENDRA SINGH

Abstract of the thesis accepted by the University of Jodhpur
For award of Ph.D. in Geography in the year 1985*

The results of the studies conducted on the significance of the geomorphology in the spatial development planning of an arid environment with special reference to Jodhpur district by employing the advanced remote sensing techniques in conjunction with ground truth are summarised below.

The district under study lies between latitudes 25°55' to 27°33'N and longitudes 71°47' to 73°52'E and occupies an area of 22,860 sq km. The climate of the district is arid to extremely arid and the aridity index varies from 70 to 87 which increases from southeast to northwest. Mean annual rainfall based on 80 years rainfall data (1901-1980) ranges from 425 mm in south-east to 200 mm in northwest. The coefficient of mean annual rainfall varies from 38.5 to 59.6 per cent. The relative humidity varies from 60 to 70 per cent and the average wind speed is 18.3 kmph at Phalodi and 13.4 kmph at Jodhpur. The Luni river with its major and minor tributaries like the Mitri, the Jojri, the Gotabar and the Badi form the drainage system of the district.

Geological formations from Archaean to Quaternary eras have been encountered in the district. The oldest formations of the district are Aravalli slate and phyllite of Archaean era which are overlain by the Malani rhyolite and granite of Algonkian era. The formations of the Marwar super group, comprising of arenaceous sandstone of Jodhpur group, calcareous limestone of Bilara group and arenaceous sandstone of Nagaur group and belonging to Lower Palaeozoic era, occur unconformably over the Malani igneous suite.

*This research work was done under the supervision of Dr. A.K. Tewari, Professor and Head, Department of Geography, University of Jodhpur.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

Bap boulder bed and Badhaura sandstone of the Upper Palaeozoic era, overlying the Marwar super group formations, largely occur in the northwestern parts of the district. Quaternary formations comprising of blown sand, younger alluvium and older alluvium occur all over the district.

The study on the evolution of the landforms has revealed that they have been created by the fluvial and aeolian geomorphic processes which operated on various lithological formations under different climatic phases. Fluvial landforms were formed by fluvial action under two prolonged wet phases, probably in Pleistocene and early Holocene periods and the aeolian landforms were originated by aeolian activities under two prolonged arid phases, probably in pre-Holocene and Recent periods.

Based on the evolutionary history, morphological, spatial and spectral characteristics, the district has been divided into sixteen landform units. The hills, rocky/gravelly pediments, flat and sandy undulating buried pediments occupy 20.97 per cent of the total district area. Flat, gravelly and sandy undulating aggraded older alluvial plains cover the largest area (50.70) per cent) of the district. The variations within the morphological, spatial and spectral characteristics of these landform units have been detected from the Landsat bands 5 and 7 images of dry/cool season. Sand dunes and interdune plains largely occur in the western parts of the district and cover 24.48 per cent of the district total area. These landform units due to their shape and location are distinctly visible on the Landsat band 7 image. Younger alluvial plains, graded river beds and saline depressions are concentrated in the eastern parts of the district and occupy 3.85 per cent of the total area. These landform units distinctly appear in dark grey to dark and bright white tones on the Landsat images of all the four spectral bands.

Digital analysis of the Landsat data in the form of computer compatible tapes (CCTS) enabled to evaluate the micro-variations in the drainage characteristics, slopes, erosional and depositional features of the landform units which could not be detected from the visual interpretation of the Landsat imageries and aerial photographs.

Investigations on the geomorphology and natural resources have revealed that the genesis, distribution, fertility and physico-chemical characteristics of the soils are closely related to the genesis and distribution of different landform units. Shallow coarse textured gravelly soils are associated with hills, rocky/

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

gravelly pediments, gravelly aggraded older alluvial plains and graded river beds. Light textured fine sand to fine sandy loam soils of Chirai series with low fertility have developed on deep to very deep flat aggraded older alluvial plains, sandy undulating aggraded older alluvial and interdune plains. Light to medium textured loamy sand to sandy loam soils of Bhopalgarh and Soila series with 0.22 to 0.32 per cent organic carbon occur on flat buried pediments. Medium textured sandy loam to loam soils of Pipar series with 0.25 to 0.45 per cent organic carbon are associated with moderately deep to deep flat aggraded older alluvial plains. Fine textured loam to clay loam and silty clay loam soils of Malkosni series and Asop and Gajsinghpura series with 0.20 to 0.25 per cent and 0.25 to 0.50 per cent organic carbon respectively, are developed on saline and non-saline flat deep aggraded older alluvial plains.

The study on the relationship between geomorphology and vegetation has revealed that the growth, development, distribution and density of vegetation is closely related to the different landform units. Hills, rocky/gravelly pediments and gravelly aggraded older alluvial plains with well developed joints and thin cover of soil support *Buphorbia caducifolia—Acacia senegal* (Thor-Kumut) and *Capparis decidua —Maytenus emarginatus Zizyphus nummularia* (Kair-Kangkera-Bordi) communities with 30 to 70 plants/ha. Flat buried pediments and flat aggraded older alluvial plains with loamy sand to sandy loam soils are occupied by *Prosopis cineraria—Capparis decidua* (Khejari-Kair) and *Zizyphus nummularia—Acacia nilotica* Ssp; *indica* (Bordi-Babool) communities. Aeolian landforms viz; sandy undulating aggraded older alluvial and interdune plains, sand dunes and sandy undulating buried pediments with deep to very deep sandy soils support *Acacia senegal—Calligonum polygonoides* (Kumut-Phog); *Trosopis cineraria—Tecomella undulata* (Khejari-Rohida) and *Zizyphus nummularia—Calligonum polygonoides* (Bordi-Phog) communities. Saline depressions with saline soils are occupied by *Haloxylon salicornicum Sporobolus marginatus* (Jinolana-Kharighas) community.

The study on the relationship of geomorphology with surface and ground water resources has indicated that distribution, development and potentials of these water resources are closely associated with different landform units. The surface water occurs in the rivers, *nadis*, tanks and canals. In the district, 1314 *nadis* of small, medium and large size with 4.84 mcm; 5.08 mcm and 4.40 mcm volume of water respectively, have been constructed

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

under different landform units. The total volume of water in these *nadis* comes to 14.32 mcm. There are 27 irrigation and 3 drinking water tanks which occur under different landform units and their volume of water varies from 0.10 to 52 84 mcm. The total volume of water in both types of tanks is 98.21 mcm. Quantitative analysis of the geomorphological characteristics of the catchments and their relationship with each other has enabled to identify 47 potential catchments under sandstone, limestone and rhyolite landforms.

Twelve shallow and deep aquifers have been identified under different landform units. Shallow aquifers such as blown sand, older and younger alluvial and prior stream beds occur under sand dunes and interdune plains, younger alluvial plains and flat aggraded older alluvial plains. The static water level of these aquifers varies from 8 to 18 m b.g.l. Deep aquifers such as Jodhpur and Nagaur sandstone, Malani rhyolite and granite and Bilara limestone have developed under rocky/gravelly and buried pediments, sand dunes and interdune plains and sandy undulating aggraded older alluvial plains. The static water level in these aquifers varies from 20 to 105 m b.g.l. and their ground water potentials have not been fully exploited so far. The sufficient scope still exists for the exploration of the ground water.

Geomorphology has a direct bearing on the land use of the district. Flat aggraded older alluvial and interdune plains occupy the largest area of the district and they form backbone of the district in the agricultural production. The intensity of cultivation varies from 40 to 60 per cent and 60 to 80 per cent. Both rainfed and irrigated crops like *bajra (Pennisetum typhoides)*, *moong (Vigna radiata)*, *moth (Vigna aconitifolia)*, wheat *(Triticum aestivum)* and gram *(Cicer arietinum)* are grown on these landform units. Sandy undulating aggraded older and interdune plains, sandy undulating buried pediments and sand dunes due to physical constraints like irregular slope and severe to very severe wind deposition hazard are occasionally cultivated with *bajra (Pennisetum typhoides)*, moong *(Vigna radiata)* and *guar (Cyamopsis tetragonoloba)*.

Flat buried pediments and younger alluvial plains due to good ground water potentials and less severe environmental hazards are used for growing irrigated crops like wheat *(Triticum aestivum)*, barley *(Hordeum vulgare)*, chillies *(Capsicum annum)* and vegetables. The rainfed crops like *bajra (Pennisetum typhoides)*, *guar (Cyamopsis tetragonoloba)*, *til (Sesamum indicum)* and *jowar (Sorghum bicolor)* are also raised on these landform units.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

The hills, rocky/gravelly pediments, gravelly and saline aggraded older alluvial plains due to thin cover of sediments, severe to very severe water erosion and salinity/alkalinity hazards are not fit for cultivation but they are suitable for pastures. The environmental hazards like the salinity/alkalinity, floods and industrial effluents have caused changes in the land use patterns of the district.

Geomorphic investigations on the environmental problems have indicated that water erosion, wind erosion/deposition, salinity/alkalinity, floods, meandering, sand dunes and water pollution are the major environmental hazards which are causing serious damages to the agricultural lands, roads, railway lines, canals and permanent structures of the district.

The water erosion in different landform units has resulted due to the detachment of the sediment particles by rain drops and their subsequent transportation by the flowing water. This erosional hazard in the form of sheet, rill and gully has desertified 3586.11 sq. km. (15.69 per cent) area of the district under fluvial landform units viz; hills and rocky/gravelly pediments, flat buried pediments, gravelly aggraded older alluvial plains and flat aggraded older alluvial and interdune plains.

The wind deposition hazard in the form of sandsheets, hummocks and sand dunes has been created by the geomorphic aeolian processes. This hazard has affected 10,459.19 sq, km. (45.76 per cent) area of the district and occurs in the sandy undulating aggraded older alluvial and interdune plains and sandy flat aggraded older alluvial plains.

The complex hazard in the form wind deposition and water erosion occurs in the sandy undulating buried pediments and it has desertified 1345.02 sq. km. (5.89 per cent) area of the district.

The salinity/alkalinity hazard has been created by natural and man-induced processes. The natural salinity/alkalinity hazard in the saline depressions has affected 211.67 sq. km. area (0.93 per cent) of the district. Man-induced salinity/alkalinity hazard has desertified 347.60 sq. km. (1.51 per cent) area of the district in the deep saline flat aggraded older alluvial plains.

It is inferred from this study that out of total 22,860 sq. km. area of the district, 15,949.59 sq. km. (69.78 per cent) area has been desertified by the erosional, depositional and salinity/alkalinity hazards and remaining 6910,41 sq. km. (30.22 per cent) area is free from such hazards. To check these hazards, the control measures like contour bunding, contour furrowing, stubble mulching and wind strip cropping have been suggested.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

The study on the dynamics of the sand dunes has revealed that six types of dunes viz; obstacle, parabolic, longitudinal, transverse, barchan and shrub-coppice occur in the district. These sand dunes have been originated by erosional and depositional geomorphic processes under different climatic phases. The first four types of sand dunes are well stabilised and vegetated with *Acacia senegal* (Kumut), *Prosopis cineraria* (Khejari). *Acacia tortilis* (Bawali), *Maytenus emarginatus* (Kangkera) and *Calligonum polygonoides* (Phog). The latter two types of sand dunes are active and devoid of vegetation.

It has been observed that the significant variations exist in the morphological, pedological and chemical characteristics and available micronutrients of the sand dunes. The sand dunes are 90 cm to 4.5 m and 6 to 80 m in height and their slopes of windward, flanks and leeward sides vary from 2° to 3°, 6° to 12° and 20° to 24° respectively. The size of sand grains varies from 0.06 to 0.25 mm with an average diameter of 0.12 mm and 0.14 mm.

The soils of these sand dunes are structureless, compact, calcareous and non-calcareous fine sand. The content of the organic carbon in the soils is low, varying from 0.10 to 0.13 per cent. The electrical conductivity and pH of the soils ranges between 80 to 623 micromhos/cm and 7.4 to 9.1 respectively. These dunes are well supplied with available iron, zinc and copper and more than 50 per cent soil samples are deficient in available manganese.

Flash floods of July 1979 and 1983 which occurred in three geomorphic zones of the district viz; younger alluvial plains and river beds, buried stream channels and pediments, were resulted due to climatic and hydrogeomorphic factors. These flash floods had caused colossal devastations to the agricultural lands by creating deep dissections and accumulating thick coarse riverine sediments, human and animal life, engineering structures and means of communication. The suitable measures like deepening of river beds and construction of embankments along the river banks to control the flood hazards have been suggested.

The study on the dynamics of the meandering rivers has revealed that the migration of the beds of the Luni and its tributaries has also affected the agricultural lands, dams and bridges of the district. The results of the significant relationships between geomorphic characteristics of the meandering rivers like the width and length of the meander belt, width of the existing channels, mean radius of curvature and amplitude have revealed that these

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

characteristics could be utilised to calculate the discharge of meandering rivers and to locate the favourable geomorphic sites for the construction of the dams and bridges etc.

The study on water pollution has revealed that the effluent water from the textile industries of Basni has polluted the water of the open dug wells located along the banks of the Jojri river. The electrical conductivity and pH of this water have gone upto 1973 micromhos/cm and 9.6 respectively and in the case of effluent water they are 2225 micromhos/cm and 9.7 to 11.7 respectively. The polluted water due to the presence of the anions like chlorides, carbonates and bicarbonates has made the soils sodic and hard crust is developed. The double cropped lands have been changed into single cropped lands by the sodic soils and polluted water and the yields of the rainfed and irrigated crops have also been considerably decreased by the above hazards.

The study on the rural settlements has revealed that geomorphology controls the growth, development, distribution, patterns, density, size and spacing of various types of settlements under different landform units. Compact settlements with semi-circular, horse shoe, square, triangular, elongated and tree patterns, 1.2 to 8.5 km spacing and 6 to 15 settlements/100 km^2 density occur in the younger alluvial plains, flat aggraded older alluvial and interdune plains.

Semi-compact and dispersed settlements with fan, rectangular, hollow, square and rectangular patterns, 3.5 to 14 km spacing and 2 to 6 settlements/100 km^2 density have developed in the sand dunes and interdune plains, sandy undulating aggraded older alluvial plains, saline flat aggraded older alluvial plains, rocky/-gravelly and sandy undulating buried pediments. In the dispersion of the above settlements, a significant variation exists under different landform units as 'R' values vary from 1.32 to 1.84. But 'R' values in the flat buried pediments and plateaus, younger alluvial plains and flat aggraded older alluvial plains are almost equal which indicate that the settlements under these landform units are uniformly distributed.

Based on the different landform units and their associated natural resources and environmental problems, fifteen Major Land Resources Units (MLRU) having certain degree of homogeneity in geomorphology, soils, vegetation, water resources and land use patterns have been identified. The evaluation and assessment of the resource potentials of these resource units have indicated that they have different physical potentials and limitations and could be

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

properly utilised for the integrated development planning of the district.

Sandy undulating aggraded older alluvial and interdune plains with light textured soils could be used for rainfed farming with strong wind erosion/deposition control measures like stubble mulching, wind strip cropping and wind breaks etc. Deep to very deep flat aggraded older alluvial plains with moderate wind erosion/deposition control measures could be put under rainfed farming. Moderately deep to deep flat aggraded older alluvial plains with medium textured soils are suitable for rainfed and irrigated farming with soil and irrigation management and ground water exploration.

Sandy undulating buried pediments having light textured soils are best suited for rainfed and irrigated farming with strong wind erosion/deposition and water control measures such as stubble mulching, wind strip cropping, contour furrows and contour bunding etc.

Flat buried pediments and younger alluvial plains comprising of light to medium textured soils are the most potential resource units of the district. These resource units are best suited for irrigated and rainfed farming with ground water exploration, moderate wind deposition and water erosion and flood control measures. Deep saline flat aggraded older alluvial plains having saline soils are fit for irrigated farming and pastures with judicious use of saline water and suitable salinity/alkalinity control measures. Deep flat aggraded older alluvial plains with fine textured soils are best suited for runoff farming with soil and water conservation measures like contour furrows and trenching etc.

Rocky/gravelly pediments, gravelly aggraded older alluvial plains and shallow to moderately deep flat aggraded older alluvial plains having light textured soils could be developed into pastures with proper soil and water conservation measures. Sand dunes with very deep fine sand could be developed into silvi-pastures with proper wind erosion/deposition and biotic control measures. Hills having different types of rocks are best suited for quarrying road and building material with proper measures of soil and water conservation. The saline depressions comprising of highly saline soils could be best utilised for extracting salts and pasture development with salinity/alkalinity management.

The suitable measures for the planning and management of surface and ground water resources under different landform units have been suggested. The favourable geomorphic sites for

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

the surface water development like the construction of anicuts, check dams, *nadis* and *tankas* (cisterns) have been located and mapped. The unexploited and under exploited recharged (receptor) ground water zones for the future development of the ground water have been proposed. The over exploited, polluted and saline recharged (receptor) ground water zones should not be used for further exploration, otherwise they will have adverse effect on the irrigated lands.

The suitable measures for the planning of the existing rural settlements, roads and railway lines and also the favourable geomorphic sites for the construction of such new structures under different landform units have been proposed. In future, the rural settlements due to their low density should be largely constructed in interdune plains, gravelly aggraded older alluvial plains and sandy flat aggraded older alluvial plains located in the western parts of the district.

CONCLUSIONS

From the findings of the investigations on different geomorphic aspects of the district, the following salient conclusions have been derived :

1. The district had undergone 'climatic desertification' more than once during the Quaternary period and at present there is no sign of such desertification. In other words, the desert is not spreading towards northeast and contrary to it, the desert is shrinking towards west. However, the increasing biotic stress on the fragile landforms (ecosystems) has deteriorated their productivity, resulting into 'biological desertification'.
2. From the analysis of the size, shape and mineral composition of the sand grains of the sand dunes, it has been concluded that the source of the dunes sand is not Rann of Kutch as earlier reported but it has been locally derived from the existing landforms of the region. It has also been inferred that dune sand is not of marine origin but it has originated due to the reworking of the fluvial sediments by prolonged aeolian processes.
3. It has been inferred that the sand dunes are of two systems viz.; old and new. The former are stabilised and they do not need any plantation for their rehabilitation if they are protected from the biotic interference and are properly managed. The latter are active and need immediate attention for their stabilisation by suitable phyto-reclamation technique.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

4. It has been observed that the beds of the prior streams, buried under the alluvium and aeolian deposits are the favourable geomorphic sites for the exploration of shallow ground water. The photogeomorphic technique is an important tool for the identification and location of such shallow aquifers.
5. It has been observed that the recharge (donor) zones are the main source of recharge for the recharged (receptor) zones. These donor zones, therefore, should be properly managed for better recharge and not for exploitation of ground water.
6. It has been concluded that the rocky/gravelly pediments developed on different lithological formations are the best geomorphic locations for the development of the surface water resources which could be utilised for artificial recharge of the adjoining aquifers.
7. It has been inferred that the unstable landform units like the beds of the prior stream channels, younger alluvial plains and pediments should be avoided from the construction of roads, railway lines and settlements, otherwise cost of maintenance will exceed its quantitative economic return in a long period of time.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

POPULATION GEOGRAPHY OF RAJASTHAN CANAL COMMAND AREA

SATISH CHANDRA MISHRA

Abstract of the thesis accepted by the University of Jodhpur
For award of Ph.D. in Geography in the year 1985*

The present research work seeks to study the population geography of Rajasthan (Indira) Canal Command Area. This area lies in the western part of Rajasthan state between 26°1′ and 30°6′ north latitudes and 69°29′ and 75°30′ east longitudes, covering an area of 86261 km² and a total population of 3093667 with an average density of 36 persons per km². Included in this area are the districts of Ganganagar, Bikaner and Jaisalmer. Although on the population map of India this region presents a sparsely populated area, on the world map of desert regions it has the highest population density (36 persons per km² as against only 4 persons per km²). The region provides one of the classical examples of transformation of man-environment system changing from determinism to landscape creation by man.

The objective of the study is to describe population geography of the Rajasthan Canal Command Area with emphasis on the physical and cultural factors affecting aspects of population. Population movement in the Canal Command Area is, at present, not simply dominated by migration to towns and cities, rural to rural movements between established villages and to new areas of colonisation are also important.

Population redistribution is not merely the result of the movement of people from one area to another; it is influenced by differential rates of fertility and mortality. Some areas grow faster than others, perhaps because of the eradication of disease that lowers the death rate in one area and not in another, or because of larger families in one area and smaller in another.

Population geography of the region has been studied at three

---

*This research work was done under the supervision of Dr. A. K. Tewari, Professor & Head, Department of Geography, University of Jodhpur.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

area levels: regional, sub-regional and micro-regional. The regional level study has facilitated comparisons at the state and national levels. At the sub-regional level, district has been chosen as a unit of study, while at the micro-level, tehsil has formed the basis of study.

The physical and cultural factors have been analysed through various statistical measures, i.e., central tendency, dispersion analysis, coefficient of correlation and regression line analysis. In order to study the factorial structure of population variables, about 38 variables were fed to the computer to obtain intercorrelations between each of the variables and then to prepare correlation matrix and compute first 4 principal components. Demographic as well as physical variables have been tested through such statistical methods as the Gini's coefficient of concentration, Lorenz curve and location quotient. Most of the statistical techniques applied have been represented both graphically and cartographically wherever required.

Chapter 1 of the present study deals with landscape factors affecting population. A study of the landscape factors reveals that the physical and economic factors operate separately, and not together in determining the pattern of population distribution in the Rajasthan Canal Command Area, the former being more important in its southern part.

The physical factors comprising geology, physiography, drainage, climate, vegetation and soils react with double effect upon human life and behaviour. The entire region is covered with wind-blown sand and alluvium with some isolated patches of monodnocks and knolls. The Jaisalmer-Bikaner tract was under sea during Jurassic, Cretaceous and Eocene ages. The Ghaggar plains in the north are composed of older alluvium overlain by Pleistocene sand. The Magra region extending from Bikaner to Jaisalmer is a gravel and rocky plain with a sparse population. Further southwards, the Thar is a dry and desolate expanse of thick sand cover completely devoid of any drainage. Practically, there is no surface drainage in the whole of the region owing to a high degree of continentality, scant rainfall, high temperature and sandy surface. The drainage is typically precarious and internal. The meagre drainage has acted as a great natural impediment to human existence and economic growth.

Climatically, the region is characterised by extremes of temperature and low, erratic and seasonal rainfall. Summer temperature reaches as high as 42°C while winter temperature often falls

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

below the freezing point. A high degree of aridity coupled with an acute water deficiency is experienced all over the region. The discomfort index shows that Ganganagar is more comfortable than Jaisalmer and Bikaner. The annual rainfall is limited to 25 cm with a high degree of variability. Consequently, the vegetal cover is very thin and large areas are covered with thorny scrub and stunted vegetation. During the rainy season some grasses grow which serve as pasture. The soils of the region are sandy with a very poor clay content. They have a high degree of soluble salts and high pH values. The soils of the Ganganagar district are, however, fertile alluvial soils supporting such important crops as wheat, rice, cotton and tobacco.

The characteristics of population are affected by such cultural factors as land utilization, irrigation, agriculture, animal husbandry, minerals, industry and means of transport. About 31.4 per cent of the total area is net sown while 51.1 per cent falls under cultivable waste which can be ploughed after reclamation. Of the entire cultivable land only 24.9 per cent area is irrigated. The most highly irrigated land is found in Ganganagar district. In the southern part of Bikaner and the whole of Jaisalmer dry farming is done. There has been found a close relation between population density and the land under irrigation. The main crops of the region are wheat, bajra, barley, gram, cotton, maize and rice. Mostly in the northern part of the region irrigation facilities are available. A prominent portion of the livestock is composed of cattle, buffaloes, sheep, goats and camels, while the animals coming under the heads of poultry, horses, ponies and pigs are relatively scarce. Next to cultivation, animal husbandry is the main occupation of the people.

Though mineral fuel, metallic minerals and non-metallic minerals are found here, the prominent place is occupied by mineral fuel and non-metallic minerals. Agro-based and animal-based industries play an active role in the economy of the region, but the industries based on minerals are scarce. In the northern part are situated agro-based industries, while those based on livestock are located in the southern region. They are all small-scale. This is a very wide and expansive area, which is lacking in adequately developed railways and roadways, but considering the traffic flow they are quite sufficient.

In Chapter 2 the dynamics of population growth has been dealt with in great detail.

There has been such a striking growth of population in this region that it demands a serious study in order to take into view

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

the situation as is likely to develop in near future. Among several factors that have been found to contribute to rapid rise in population the most significant ones are high birth rate, reduced death rate and high immigration during the past several decades. Due to these factors a $7\frac{1}{2}$ times rise in the region's population has been recorded during the present century which is $3\frac{1}{2}$ times greater as compared with that of the state of Rajasthan and 3 times greater than that of the country. At the level of the districts the rise in Ganganagar is $14\frac{1}{2}$ times, in Bikaner $4\frac{1}{2}$ times and in Jaisalmer $3\frac{1}{2}$ times, which in the case of Ganganagar is to be attributed to the combined impact of the developed agricultural methods and extensive irrigational facilities. Interestingly enough, once in eighty years, in 1921, the population rate declined following the outbreak of the cholera epidemic which was widespread in the entire sub-continent. Ever since that period the region has recorded a steady rise in population and during the decade 1971-81, Anupgarh tehsil (District Ganganagar) has recorded the highest growth (152.0 per cent) in the country as well as in the state. Increasingly developing agriculture and other material facilities have attracted large-scale population toward the region. If this trend continues and the rate of migration keeps up then it is very likely that by 1991 the population of the whole region would rise exponentially up to 3767390 and by 2000 to 4684420, while the density of population for the region would be 48 persons per in 1991 and 60 in 2001.

The demographic dimensions and human resources have been studied in Chapter 3. Through the Gini's Coefficient Value (0.5488) it has been discovered that 54.9 per cent of the land accommodates cent-per-cent population leaving the remaining 45.1 per cent unpopulated. The largest concentration of population is to be found in Bikaner tehsil and the lowest in Sangaria tehsil. The density of population, however, varies from tehsil to tehsil, ranging from 273.8 persons in Ganganagar tehsil to 4.2 in Jaisalmer tehsil. The investigator has found a positive correlation between population density and livestock density, net sown area and net irrigational area. The contours of equipotential population follows the pattern of irrigated land. The lowest value of population potentials has taken place in Jaisalmer tehsil where it has its value of 10843 persons per km^2. The points of highest population potentials correspond with harmonic mean centre of any spatial distribution. Thus the harmonic mean centre tends to lie between Ganganagar and Hanumangarh. Incidentally,

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

this nucleated zone of agglomeration is served by the most efficient system of canal irrigation, i.e. Ganga-Bhakra-Rajasthan Canal network.

Biocultural characteristics of population have been studied in Chapter 4. It has been found that the region's average sex ratio is 880 which is much lower as compared to both the state (923) and the country (928). The investigator also notes that sex-ratio-wise, rural areas have better balance of females than urban areas. A large majority of the region's population (43.2 per cent) belongs to the age-group below 14 years, 26.1 per cent to 15-29, 25.7 per cent to 30-59 and 5.0 per cent to 60 years and above. The base of the population pyramid is everywhere broad with a still perceptible broader base in Bikaner and Jaisalmer which indicates high dependency ratio and fertility rates in newly irrigated localities. The literacy percentage is 25.1 which is slightly higher than that of the state of Rajasthan yet far lower than that of the whole country. It has been found that those tehsils where male literacy rate is higher, female literacy rate is also equally high. Ganganagar and Bikaner present a model in this respect. Out of the total population of the region, nearly 29 per cent are main workers, 3.5 marginal workers and the remaining 67.1 per cent are non-workers. Nearly 70 per cent of main workers are engaged in agricultural pursuits indicating that the economy of the region is basically agrarian. The scheduled castes and scheduled tribes comprise 25.2 per cent and 0.6 per cent of the total population of the region respectively. Nomadism is found in the southern part of the region, though the population of the nomads is fast decreasing and most of the nomads are shedding their traditional way of life. Among the disabled population blind, dumb and crippled are prominent, with the blind comprising the higher ratio.

Chapter 5 seeks to analyse and discuss population dynamism, the process of population movements from one place to the other, their reasons, patterns and the salient features. During the research investigations, it was found that most of the migration has been in the rural-to-rural and rural-to-urban directions, which have mainly been short-distance events. Urban-to-urban dynamism is nearly absent in this part of India. The major influx came from the adjoining areas such as Churu, Jhunjhunu, Jalore and Jodhpur. In the Western Rajasthan agricultural development due to Rajasthan, Bhakra and Ganga Canals have awakened the hope of better future among the people causing them to migrate to this region, of which Ganganagar is a model example. Bikaner

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

has recently begun receiving water from Rajasthan Canal inducing a considerable amount of migration. But the demographic pattern and structure of post-Rajasthan Canal migration is a bit different from that of Gang and Bhakra Canals. In the former the migration is a regulated settlement process whereas in the latter it was spontaneous natural inflow of people to harvest better irrigation agriculture facilities.

At the tehsil level, Anupgarh records the largest population movement, while Jaisalmer the lowest. In 1971 there were 177 villages in Anupgarh, a decade later the number rose to 830, whereas in Jaisalmer the number of villages rose from 324 to 346 during this period.

Settlement pattern has been treated in Chapter 6. In the course of research it has been found that for the total region the percentage distribution of size of villages is 74.1 per cent as small villages, 21.3 per cent medium, 4.2 per cent large and 0.5 per cent very large villages. Whole region has 24 towns, one town providing most of the facilities to about 200 villages. Water points play a vital role in the location of the settlement. It has also been found that about 75.0 per cent population of the region lives in villages. During the decade 1971-1981 the number of villages rose by 46.0 per cent. Urban settlements are full of diversities too. From the point of view of the area Ganganagar is smaller than Bikaner and Jaisalmer but with regard to the number of towns (16 towns) it is in the forefront. The R_N values in Ganganagar and Jaisalmer districts have been worked out to be 1.65 and 1.42 respectively, which shows that the towns are uniformly distributed, while in Bikaner this value comes to about 0.48 showing aggregated nature of towns. In Bikaner district, all other smaller towns are clustered around Bikaner town. Apparently, economic factors have a decisive influence on the growth of towns. In the region space and number of towns do not have perceptible relation.

Chapter 7 deals with the urbanisation pattern in the region and its close analytical study carried out in detail. Urbanisation pattern in the region presents an interesting picture. In terms of percentage, the urban population in this region is much more than that in the state of Rajasthan and the country. About 25.0 per cent population here is urban, while for the state this figure is 20.7 and for the country it is 23.7. The urban population ratio is the highest in Bikaner (67.5 per cent) and the lowest in Pokaran (9.1 per cent). Not a single town has been found in the three tehsils, i.e. Tibi, Kolayat and Lunkaransar. About 51.0 per cent

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

urban population lives in category I town. An interesting feature of the urban centres is a high literacy rate and low sex ratio. One glaring fact that has come to the fore is the pattern of urban population rise in Ganganagar, Bikaner and Jaisalmer during the present century. Urban population in Ganganagar rose by 60 times, while in Bikaner and Jaisalmer it increased by 6 and 2 times respectively. A look at the comparative figures of urban population over the eight decades in Jaisalmer and Ganganagar brings out another notable factor. In 1901 the urban population of Jaisalmer was double compared to that of Ganganagar, but at present the position is just opposite. Today Ganganagar has 13 times more urban population than that of Jaisalmer. Like the rural settlement urban settlement too does not follow any definite pattern. Towns are situated at wide distances, and the number of towns is greater in the northern irrigated part than in the southern.

In Chapter 8 is discussed and analysed the factorial structure of demographic variables. The principal component analysis determined the factor effective with demographic phenomenon. Due to semi-arid land, physiographic parameters play vast role with agricultural development and settlement pattern in the region. The first principal component is able to put forward a far more convincing explanation with regard to this region, whereas on the one hand it points out the physiographic inefficiency on the other (if the legend values are read contrarily), it also explains the demographic pressure. Very few variables are related with the second principal component, thus drawing attention to the settlement size and population growth. On the region's economic activity light is thrown by the third principal component. Nothing is clear about the fourth principal component. As a result, the situation as regards most of the tehsils is not clear.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

A GEOGRAPHICAL STUDY OF FLOOD HAZARD IN DESERT AND SEMI-DESERT ENVIRONMENT : A CASE STUDY OF LUNI BASIN WITH SATELLITE REMOTE SENSING TECHNIQUE

KAMAL NARAIN JOSHI

Abstract of the thesis accepted by the University of Jodhpur
For award of Ph.D. in Geography in the year 1985*

To the west of great Indian water divide (Aravalli) flows the Luni river, the only significant water course in the vast expanse of sand in western Rajasthan. It rises from the western slopes of the Aravalli range (locally called "Nag Pahar") near Ajmer. After flowing through the 23 tehsils of 7 districts, it merges into the Sahni marsh of the Rann-of-Kutch. The basin area of the Luni and its tributaries has been the basis of the delimitation of the study area. The eastern boundary of the Luni Basin is formed by the Aravalli ridges beyond which lies Udaipur district. Its southern boundary is marked by the State of Gujarat and the western boundary has been extended to coincide with the international boundary of Pakistan. So, the delimited region includes Ajmer and Beawar tehsils of Ajmer district; Barmer, Siwana, Pachpadra and Chohatan tehsils of Barmer district; Ahore, Jalore, Jaswantpura and Sanchore tehsils of Jalore district; Jodhpur and Bilara tehsils of Jodhpur district; Merta and Degana tehsils of Nagaur district; Bali, Desuri, Kharchi, Jaitaran, Pali, Raipur and Sojat tehsils of Pali district and Sirohi and Sheoganj tehsils of Sirohi district.

In the Luni Basin, it is seen that quite a vast tract of land alongwith the main Luni river channel of Jodhpur, Barmer, Pali and Jalore districts has been revaged by floods although the number of flood occurrences differs in different areas. But there are well-identified areas where floods occur. Particular mention can

---

*This research work was done under the supervision of Dr. A.K. Tewari, Professor and Head, Department of Geography, University of Jodhpur.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

be made of the lower Luni Basin in Barmer and Jalore districts. The Luni takes a sharp turn towards the south in this region and on the left bank of the river land where lies Balotra town, affected by frequent flood. Here the river bed is flat and it gets spread during excess flow of water. Here it turns to the south and damages the villages which are situated on both sides of the river. In Jalore district, it gets spread over a large area and makes a delta. The whole water of the Luni Basin flows through Sanchore tehsil in Jalore district and a number of villages get damaged during the flood period.

The present research study is confined to the geographical study of the flood hazards in the desert and semi-desert environment with reference to the Luni Basin. The major portion of help in collecting the data has been taken from the Remote Sensing Technique. At the outset, the present researcher has set himself certain limitations with respect to the area of study, the methodology of analysis and the problems of the flood hazards. He feels that certain conventional modes and instruments of research in similar areas have become outmoded, therefore, they are not reliable at all. In the fields of science and technology, especially with the rapid growth of electric devices and space science, it became inevitable to search the modes of application of these areas to geographical problems too. Geography is no longer a field exclusively confined to the methods of social sciences. Its scientific nature has compelled us to take it into the regions of other scientific disciplines—especially those of space-technology. With India's entry into the space age, and with India's own satellites being sent into the space, geography cannot remain confined to the old tradition any longer. It has sought help from the space science as well. In our country, such areas as meteorology, weather forecast and oceanography have become highly dependent upon these latest advances in the space research. Geography is, thus, closely related to satellite technology.

The present researcher felt it essential that serious research must take cognizance of these inter-disciplinary developments. It opens a new exciting field for interactions. The present researcher has, therefore, selected a local regional area to study a typical flood hazard problem with the help of the Remote Sensing Technique.

After conducting detailed research, the present researcher has reached the conclusion that the main factor responsible for flood in the Luni Basin area is the physiography of the Luni river

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

which has a length of nearly 800 kms with an average slope of 1 in 1500 and a depth of 3 metres. The most remarkable feature of this river is that it tends more to increase its width than deepening its bed.

IMPORTANCE OF THIS RESEARCH WORK

The importance of this work lies in the fact that it is the first step towards understanding in detail the problems which concern everybody in this region. Floods are common here, and the basin plays a key role for the knowledge of the physiography. Lack of this kind of knowledge has led to complete devastation of life, property and settlement. None has ever attempted to study these local problems. This research, by revealing these problems, and going to the roots, is of a great value to the specialists as well as the common man. By knowing the phenomenon of flooding, its causes have also been found out, and a lot of drawbacks and inadequacies realised. Through a knowledge of these inadequacies, it became important to devise ways and means to minimise them. Therefore, the present research is a pointer to many geographical, social and economic problems of human interest. It tries to point out a new area of research which is vast and is still unexplored to a considerable extent. Many new researches on the related problems may be conducted and the lot of the people improved.

RELIABILITY OF THE METHODOLOGY

This researcher feels that the traditional methods of investigation are no longer adequate for a more precise and accurate analysis. Besides, they are time-consuming and mostly unwieldy. Recent developments in the space technology and other scientific areas have fortunately come to help researches in the areas of geography. For accuracy and precision in the analytical procedures, geography has come to rely more and more on highly improved sources such as remote sensing techniques, satellite feedback etc. The present research work is one of the first instances in which remote sensing techniques have been adopted for investigating a local geographical phenomenon. The present researcher feels that this reliance on satellite data has helped him in a long way to deal with the data that are very accurate and precise. According to older methods, collecting such data would have consumed a lot of his time and required an extensive survey work whose reliability in the long run would not be near-perfect. Some of the advantages of this method are given below :

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

To analyse the data both interpretation techniques i.e. visual and digital are employed. The study reveals that because of the large area covered at a time and pitcurable within no time, the flood information can be extracted and used for further measures. The flood inundation can be mapped and relief measures started wherever it is in emergency situation.

The historical records of floods can be kept in the form of satellite pictures for hydrological analysis and for planning purposes. On the basis of this record, the flood zone can be delineated and mapped.

The satellite has its own limitations. If it does not pass over the land during flood peak or the land is covered with clouds, it will fail to record the required data. In that case, a study on the basis of lateral effects of the floods also helps a lot in deriving many valuable conclusions.

In the present study, satellite picture was available after two months of the flood; only then some results could be derived such as overflooded river could be easily detected through the satellite picture of band No. 7, and, on the basis of that, the area under flood could be detected.

The magnitude of the flood could also be studied on the basis of the analysis of the river channel and it was found that the flood was concentrated in the upper Luni Basin, mostly in the sub-basins of Jojari, Luni, Guhiya and Sukri etc.

The study reveals that the river water was spread very widely at Balotra town and to the west of it. This point is the confluence of the buried channels of Jojari, Pachpadra and the main Luni river.

The buried and disorganised river channels could be detected through satellite remote sensing to conclude that this is the only tool to detect the buried channel. A close relationship between the flood damage and the buried and disorganised channels is seen in the study. About 10 buried and disorganised channels could be detected and it was seen that heavy losses had taken place at those villages which were situated on the confluence of the buried channels and the main river or along the disorganised river courses which become active only during excess rainfall. Such type of phenomenon can be seen in the lower Luni Basin too.

A detailed temporal study has been attempted by using digital analysis. For this purpose, a small area covering 1918 sq kms of the Sardar Samand area was selected and processed on the

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

Multispectral interactive Data Analysis System at the National Remote Sensing Agency, Hyderabad.

This shows a dynamic change in the landuse. The lateral effect of water which is found in scattered pockets all over the area compelled the present researcher to think that the area had certainly been under water for quite some time. The water spread area of the reservoir could be calculated and an increase of about 100 sq kms in the case of Sardar Samand was noticed.

A major change could be witnessed in a large area of agriculture and the fallow land has been converted into barren land. It is only due to the erosion caused by swift and sharp current of water. This shows the severity of floods.

On the whole, the study reveals that the satellite data can be used to delineate the flood-inundated areas and the map flood hazard zones so that elevation measures can be initiated. It can provide the planner a valuable information about the entire flood plain so that comprehensive measures can be formulated. Though the 18-day (now in Landsat-5, 16-day) repetitive coverage might seem inadequate to map the crest of the floods, it is still possible to delineate the areas inundated and undertake flood damage assessment, because the receding waters have identifiable residual effects on soil moisture, vegetation etc., even days after the crest has passed. Flood inundation mapping also provides information about the flood plain response to specific floods. The effectiveness of the existing flood control works in containing floods can be studied and vulnerable reaches identified; and strengthening of the existing structures or the planning of the new structures can be undertaken. Although remote sensing has become an important useful tool in providing data on the floods, it cannot altogether replace the existing ground-based methods. Conjunctive and judicious use of both the systems would positively help engineers and planners to solve many intricate problems.

INADEQUATE FLOOD CONTROLLING MEASURES

During the course of research, this researcher came across numerous drawbacks and loopholes in flood-controlling measures, both through public organisations and government bodies.

In the absence of any river gauge sites in the basin, it is very difficult to arrive at a correct runoff of all the sub-basins and as such it has been possible to calculate the same only at the key points which exist at the dams namely Jaswant Sagar, Bankli, Hemawas and Sardar Samand.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

The water level of the Luni river at the Gandhav bridge on the National High way No. 15 in Barmer district had been maintained by Irrigation sub-division, Sanchore and this point being almost at the outlet of the basin, has been considered with rainfall data for calculating the runoff of the whole Luni Basin. Similarly, the peak discharge has also been worked out on the basis of the recorded highest flood marks at various points and the local information obtained from the local residents.

The flood hydrographs of the flood in 1979, with respect to the rain gauge data, have been plotted to represent the variation of discharge graphically. They show that the hydrographs are single-peaked in shape with gradual rise and fall which shows almost one and the same time of the concentration of the flood. It is obvious as the basin is fan-shaped.

The study reveals that the runoff in percentage of rainfall had been as high as 62% in the Bendi Hemawas sub basin whereas at the Gandhav bridge for the whole basin, it came to be about 39% only.

The volume of flood i.e. the total runoff the basin that passed through the Gandhav bridge was 4,229 Mcu.m. which can also be expressed as 5.27″ with respect to 34,654 sq kms catchment area which was 29.86% of the average rainfall.

FINDINGS ABOUT FLOOD PHENOMENA IN THIS REGION

August is the rainiest month in normal conditions. But many times due to abnormal meteorological conditions, excess rainfall occurs in the area in the month of July or August. Normally the monsoon of this region is associated with the west-ward moving depressions of the Bay of Bengal and the south-west Arabian sea monsoon, attracted by the common centre of low pressure situated in the north-west corner of the Indo-Pakistan sub-continent. Sometimes the monsoon rains are associated with the rare depressions from the plains in the north and also with the easterly winds. Part of it occurs due to local thunderstorms.

During the last 85 years long history of meteorological records, one or the other tract has witnessed such phenomenon. In the last decade i.e. 1971-1980, such phenomenon occurred four times. The July 1979 spell was a record for the area affected. Besides the detailed meteorological study of 1979, other 3 spells were also studied and an abnormal phenomenon was noticed that in 1973 Erinpura received a rainfall of 350 mm each day for two successive days. Sirohi in one day on 31st August received 76 mm and Siwana 315 mm in a single day. In the year 1975,

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

Nagaur region received 637 mm in 12 days in the month of July, which is an all time record. The havoc was maximum in 1979 because the area under flood was relatively large and it happened to coincide with catchment of the Luni drainage.

In addition to this, the heaviest one day rainfall recorded at stations in each district of the Luni Basin has been studied. It was seen from an examination of daily rain fall of rain gauge stations that the rainfall of the order of 163.8 to 511.8 mm per day had occurred at individual stations in the past. Sanchore in the Jalore district had recorded the highest daily rainfall of 511.18 mm on September 16, 1893.

On 16th July 1979, the monsoon was slightly associated with the west-ward moving depression of the Bay of Bengal and that of the south-west Arabian sea moving towards the low pressure centred just north of Jodhpur. The wind from the Gujarat coast (south-westerly) below at a high speed of about 60 knots at 3000' height. The winds from north of Jodhpur, Bikaner and Jaisalmer were very low in north-east to north. Both the factors created a sharp drop in the wind circulation from the Arabian sea and a strong inflow of moisture coupled with the convergence conditions resulted in a heavy rainfall in the region.

FINDINGS ABOUT THE WATER BALANCE AND THE BASIN CHARACTERISTICS

The study reveals that the total catchment area of the basin upto Chittalwana is 34,654.10 sq kms. The area below Chittalwana is flat delta where water spreads out and the area does not contribute to runoff. The Luni river and its tributaries traverse three types of topography, i.e. the upper reach in the hilly region, the middle reach in the alluvial plains and the delta reach near its outfall to the Rann-of-Kutch or its confluence with the main river. The total runoff in the basin works out to be 857 27 Mcu.m. out of which 519.38 Mcu.m. has been utilized by the existing 165 tanks.

On the basis of the hydrological data analysis, it is seen that the available water in the different sub-basins is not fully utilized. The tanks are distributed unevenly. So, in normal monsoon season, a sub-basin gets more unutilized surplus water which creates a dire problem in the event of an excess rainfall.

The situation is very poor in the Khari Bakli-Bhakar sub-basin; its total catchment areas of 2,403 sq kms collect 101.37 Mcu.m. of water out of which 36.58 Mcu.m. is utilized by 7 tanks and the rest of the 64.80 Mcu.m. water goes waste.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

Likewise, in the Jawai sub-basin, 124.84 Mcu.m. water is available out of which 73.90 Mcu.m. is utilized by 11 tanks and the rest of the 50.94 Mcu.m. goes unutilized.

Out of the 15 sub-basins only one sub-basin, the Upper Sukri has got full utilization of available runoff in normal season. With an area of 1,787 sq kms, it produces 47.68 Mcu.m. of water, which is utilized by 5 tanks.

On the basis of the above fact, all other 14 sub-basins have got surplus runoff which creates a serious problem during excess rainfall. The study reveals that 165 tanks are not sufficient to utilize the available water in normal monsoon season. A sane and sound planning of water management is the need of the hour.

Shallow depths and greater widths which result due to gradual silting of the river bed and bank-cutting cause over-flanking of the river banks; due to shifting of sand dunes, the river passage are blocked with sand; wherever there is substantial rainfall in the upper reaches the area gets flooded on account of unspecified channel course of the river. During floods, the rivers leave their old course of the river. During floods, the rivers leave their old course and form new courses by eroding banks resulting in damages to ecological system.

Meandering of rivers and overflanking of the banks in the Luni Basin are the major causes of damages to the settlements situated on the river bank.

The curvalium of flow established in a stream either due to its own characteristics or due to impressed external forces propagates down free by building up shoals on the convex side and deep channel on the concave side or the apex by means of secondary current. This is known as meandering.

Meandering of the Luni river has taken place at many points all along the courses because of the availability of soft fertile soils along its bank. In fact, there is no vegetation on the bank, and the water of the river erodes the banks and found its way towards one side of the bank which resulted in the meandering of the river course at many places damaging the important abadis, agricultural lands, wells, roads etc. by spreading in the surrounding areas as a complete sheet of water. At some places the river waters after overflanking changed the courses for kilometres together resulting in heavy losses of life and property during floods.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

DAMAGES TO THE ECOLOGICAL IMBALANCE

The study shows that the magnitude as well as suddenness of the floods not only paralysed the normal life of the people but also left a trail of unprecedented devastation. Deaths due to floods is extremely rare in this part of the country. But in 1979 floods, the loss of human life has been : Jodhpur 228 (dead or missing), Barmer 206, Pali 11, Jalore 17, Ajmer 8 and Nagaur 6. A total number of 959 villages were the victims of the flood of July 1979. The highest number of 404 villages that suffered belonged to Pali district and the lowest toll took place in Jalore district say only 64.

The economy of this region is mostly dependent upon the livestock as well as agriculture. A sudden spread of water at night at some places killed the cattle very cruelly because people could not get time to get them out of their houses. A total number of 99,967 animals were reported dead. The estimated cost was about 216.74 lakhs of rupees.

Almost simultaneously, due to heavy precipitation, all major tanks of the Luni Basin overflowed and some of them were breached also. The major tanks of Benon, Popawas, Pipar City, Borunda, Hiradesar, Basni, Bisalpur villages and Chopra Feeder of Bilara breached. The tanks of villages Salori, Madalia, Nadiakalla, Kastibund, Kuri Feeder, Surpura Feeder, Tamaria tank and Biria Canal were partly damaged. The Jaswant Sagar Dam was partially damaged. Its Kharia bank was breached and earthen slopes of the main bund were washed away causing pits near the foundations of the pucca dam wall. The canal system of the dam was also damaged badly. Out of 165 tanks, 159 tanks were affected during the floods in 1979.

The ferocity of the floods, therefore, affected the fertile area of the region. 2,02,000 hectare area of sown crops was damaged by water erosion and sand deposits. Some of the fields have been turned into the river bed and these cannot be reclaimed.

Likewise, loss to industries, particularly salt industry of Pachpadra and printing and dyeing industries of Balotra, suffered heavy damages.

According to the PHED, the PWD, the RSEB and other government departments, a loss of Rs. 100.00 crores was assessed. The details of the above mentioned agencies have been analysed.

NEW FLOOD CONTROLLING MEASURES TO BE ADOPTED

From the foregoing analysis and discussions many facts have come to light. Primarily, adequate measures to control the

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

devastating phenomenon of flash floods in the desert and the semi-desert ecological units are badly needed. Earnest attention has to be paid to them. The existing means and methods of checking floods have to be changed and modified, the drawbacks removed and new foolproof methods devised. For this the administrative and organisational perspective is to be attuned to the basic parameters of desert environment. Besides, help can be taken from the developed forms of techno-scientific devices and gadgets.

A detailed discussion of these aspects of improving the flood-controlling methods has been carried out. Flood is a natural phenomenon. But its effects are far-reaching and long-term. We cannot afford to ignore it. Nor can we allow thousands of human lives to be lost and their livelihood and structures destroyed. It is high time our government agencies took seriously the scientific suggestions put forward by experts, and did something to safeguard public interests and numerous. The basin perception of flood control in the riversine plains of north-east and coastal region is to be addressed in such areas as floods, though occasional, are invariably devastating. In the channelless sandy plains these questions are to be addressed.

IMPORTANCE OF APPLYING RECENT SCIENTIFIC TECHNIQUES IN SIMILAR STUDIES

This researcher feels that the problems that experts and scholars of geography can take up are numerous. These problems are not purely of academic interests alone. They are directly linked with human welfare and wellbeing. The geographer can do a lot to alleviate human misery and hardships. Though the present study is confined mainly to flood hazards, research on similar lines can be carried in other fields also. For this, it is essential that the facts and data collected and observed are accurate, truthful and highly reliable. Time factor and actual manual labour do form one deterring element which often disheartens a research worker. However, space-technology has simplified many methodological complexities and has brought data within easy reach.

This researcher modestly admits that he has for the first time utilized the services of the satellite remote sensing techniques. He also acknowledges that his impression has been very good. The new method has proved very encouraging and the paths of research have been made easy.

From his research experience, he can say that the future

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

geographers can take full help from the satellite remote sensing techniques for research in other related areas. The data are highly reliable and analysis approaches near-perfection.

Attempts must also be made to bring geography closer to recent technological innovations and a two-way exchange between these areas must be encouraged. Similarly, the need to explore newer of research in geography with the help of the latest scientific methods is even greater today.

SCOPE FOR FUTURE RESEARCH

The present researcher acknowledges here that this research study has already set to itself certain limitations for the sake of proper, systematic and intensive study. He feels that within these limitations he has carried his various investigations to satisfactory conclusions. However, in the course of his research, several offshoots of the problems ramified and he feels that each of these offshoots requires independent earnest attention.

Study of flood hazards in other areas too can be conducted with fruitful results. A number of such studies may finally yield a comprehensive picture of a larger connected area, which may provide scope for concerted efforts to minimise these hazards. This kind of study may also simplify government's job of streamlining the rescue and relief operations in a combined manner. This area of research, is full of promise for future scholars.

Besides, this research also underlines the urgent need to adopt the means and research methods presented by the latest scientific-technological advances. Geographical studies stand to great benefit from these advances. Our need is to foresake old, worn-out and outdated research methods, and adopt newer techniques. For this, of course, training in alien disciplines is required, but the courageous and forward-looking students of geography should be ready to accept this challenge.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

A CROSS-SECTIONAL STUDY OF MENTAL HEALTH PROBLEMS IN RELATION TO FAMILY SYNTALITY AND REACTIONS TO FRUSTRATION

RAVI KANT GUNTHEY

Abstract of the thesis accepted by the University of Jodhpur
For award of Ph.D. in Psychology in the year 1985*

Mental health, always in a given context, depends upon existing conditions, which are themselves related to the changes which take place in the environment. Mentally healthy man constantly adjusts his ways of thinking, feeling, behaving and attitudes in accordance with his make-up, the environment and the newer developments. In the human life cycle the pattern of mental health problems changes with the advancing age. At all times man has faced problems of not only body but also of mind.

One's family gives one a miniaturized frame of reference for future world and models depending upon the way one is brought up in life. Therefore, the psychological temper of the family in the form of inter-personal attitude can be strongly expected to influence one's reactions in life to changing circumstances from early adulthood to old age.

Frustrations also chisel and sculpture the raw material and the individual comes out with his uniqueness. While, some succumb to the pressure of frustrating experiences and lose their resilience, yet most of the persons are able to maintain their balance. In human life cycle, habitual patterns of reactions to frustration provide important indices of behaviour and possible predisposing personality factors as acquired by social learning.

After attaining socio-psychological maturity life becomes a new journey where in the skills acquired are to be put to test against the scarcity of resources and multiplicity of demands at significantly varying stages in life. Therefore, the journey is never a smooth one because with changing stages of life the roles, responsibilities

---

*This research work was done under the supervision of Dr. R.B. Singh, Assistant Professor of Psychology, University of Jodhpur, Jodhpur.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

and personal capacity do undergo changes. Therefore, the following problem is undertaken.

THE PROBLEM

A cross-sectional study of mental health problems in relation to family syntality and reactions to frustration is to be undertaken.

This problem can be further spelled out as under :

(i) What is the pattern of mental health problems from early adulthood to old age among males and females ?

(ii) What is the effect of family syntality on the pattern of mental health problems at different age levels among the males and females ?

(iii) What is the relationship between reactions to frustration and mental health problems at the different stages of life among males and females ?

(iv) What is the difference in family syntality among 'Healthy' and 'Hazardous' groups of males and females from early adulthood to old age ?

(v) What is the difference in pattern of reactions to frustration for 'Healthy' and 'Hazardous' groups at different stages of life, among males and females ?

(vi) What is the factorial structure of mental health problems from early adulthood to old age levels among males and females ?

HYPOTHESES

In order to investigate the relationship between the measures of mental health on one side and reactions to frustration as well as family syntality variables on the other, certain expected relationships are hypothesized.

(1) Mental health problems increase with advancing age, these problems vary at different age levels. The problems like anxiety, conversion-reactions, hypocondriasis, depression, phobia, neurasthenia, manic-depression, schizophrenic-paranoid, hyper-tension and peptic ulcer having transitory nature, from age to age, but the severity of these problems will occur among older aged than in middle age group and early adult group of subjects respectively.

(2) Subjects who having cold and rejecting attitudes from their parents will have higher scores on mental health problems, i.e., they are likely to fall in the hazardous category of mental health. On the other hand subjects who have affectionate attitude towards their parents and siblings will score lower on

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

mental health problems, i.e., they will belong to the healthy category of mental health.

(3) Low scores on mental health problems, i.e., lesser stress and enjoying mental health will exhibit significantly greater M-A direction and N-P and E-D type of reactions to frustration, whereas, the high scores on mental health problems will show significantly higher scores in I-A, E-A 'direction' and O-D 'type' of reaction to frustration.

(4) In females problems like, depression, anxiety, phobia, conversion reactions and anorexia nervosa will be more intense than in males. On the other hand, males will score higher for problems like schizophrenia and bronchial asthma as compared to the females.

METHOD AND PROCEDURE

Design

The present investigation is a correlational field study. At the first stage the nature of mental health problems for different age levels is obtained. At the second stage the degree of association among the mental health problems and reactions to frustration/family syntality variables for each age levels among males and females, is obtained. At third stage an attempt is made to make up for some of the deficiencies of correlational research by studying the differences in reactions to frustration/family syntality variables for each age level of the males and females, the total sample is to be further divided into two groups, i.e., Healthy group (below Q1 or M—.6745 S.D. of each of JMPI scales) and Hazardous group (above Q3 or M + .6745 S.D. of each of JMPI scales).

There are three sets of I. Vs. (A) subject relevant variables, i.e., sex (two sex groups) and age (three age groups), (B) Family Syntality and (C) Reactions to frustration. Comparison of groups was introduced as control in the present study. The comparison of mental health 'Hazardous' group vs 'Healthy' group on family syntality and reactions to frustration is also used as a control. Extraneous variables for the present study are controlled by matching technique (D' Amato, 1979).

Tests used

There are three main areas under investigation in the present study. Accordingly, three main tests are used. The short form 'Form A' of the recently constructed and standardized test of JMPI (Jodhpur Multiphasic Personality Inventory) by Joshi and Malik (1980) has been used for estimating the level of mental

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

health problems at three stages of life. The Indian adaptation of P-F study by Pareek, Devi and Rosenzweig (1968) has been used to assess the reactions to frustration of males and females at three stages of life. The Hindi adaptation of three family syntality scales by Joshi and Yadav (1980) has been also used to assess the intra-familial attitudes.

Sample

The incidental-cum-purposive sampling technique was used to select the subject for the present study. The details of the sample is given in the table 1.

Analysis of data

After scoring the data according to the instructions of scoring for each test, the 319 males and 315 females (for all the three groups) were analysed for the validity of obtained results by scoring them for L and F scales in JMPI. Finally 270 males and 270 females were found to give the valid responses. Two statistical techniques—the coefficient of correlation (product-moment and multiple R) and the critical ratio were used. Principal component method of factor analysis has also been used to find out the factorial structure of mental health problems at each age level.

RESULT I

INFLUENCE OF AGE ON MENTAL HEALTH PROBLEMS

On the psychoses part of the JMPI the old age people have scored comparatively higher mean for scales like, Manic depression, Hebephrenia, Schizophrenia (simple), Psychotic depression and schizophrenic paranoid than the other groups. Problems like Manic depression, Hebephrenia. Schizophrenia (simple), Schizophrenic paranoid and Paranoia also have more severity in middle age people as compared to adult subjects.

On psychoneuroses part of the JMPI the old age people have obtained significantly higher means on conversion reactions, Phobia, Depression and Neurasthenia scales than the other groups. The middle age people have more heavy burden of psychoneurotic problems like, conversion reactions, Phobia, Neurasthenia and Depression as compared to early adult people. The old aged people have shown again heavier burden of the psychosomatic problems like, Peptic ulcer, Anorexia nervosa, Hyper-tension and Bronchial asthma as compared to middle and early adult age levels. Problems like, Anorexia nervosa and Hyper-tension also have more severity in the middle age people as compared to the people of the early adult age.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

Table 1

Number of subjects and their characteristics in each group

	25 Yrs—30 Yrs		40 Yrs—45 Yrs		55 Yrs and above	
	Male	Female	Male	Female	Male	Female
Number of subjects	100	100	92	92	78	78
Age in yrs (mean)	27.47	26.74	43.69	43.03	58.37	57.66
Income status per month (in Rs.)	700-1300 for each group					
Education	All subjects were at least secondary passed					
Religion	All were Hindu subjects					

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

SEX DIFFERENCE

The problems like, Manic-depression, Psychotic-depression, Depression, Anxiety, Obsessive compulsive, Phobia, Conversion reactions, Anorexia nervosa, Neurasthenia and Hyper-tension are significantly higher in females than the males. While male subjects have shown higher scores on schizophrenic and bronchial asthma problem.

RESULT II & III

In the following pages the main findings of the present research project has been presented in tabular form for the economy of space. (table 2 to 5)

RESULT IV

FACTORIAL STRUCTURE OF MENTAL HEALTH PROBLEMS

(i) Early adult group (Male)

The first factor is identified as psychoneurotic factor which accounts for 30.98 per cent of the total variance. The second factor is named as factor of Psychoticism which has tapped 34.57 per cent of the total variance. The third fector has the heavy burden of psychosomatic problems and accounted 26.48 per cent of the total variance. The final and fourth factor is named as factor of social conformity which has represented 7.96 per cent of the total variance.

(ii) Early adult group (Female)

The first factor is identified as psychoneuroticism factor which accounts for 35.48 per cent of the total variance. The second factor is termed as factor of psychoticism which has tapped 26.62 per cent of the total variance. The third factor is named as factor of psychosomaticism which has represented 28 87 per cent of the total variance. Finally the factor of social conformity comes with 9.02 per cent of the total variance.

(iii) Middle age (Male)

The first factor has 33.24 per cent of the total variance and is termed as factor of psychoticism. The second factor has tapped 31.86 per cent of the total variance and is named as factor of psychoneuroticism. The third factor is identified as factor of psychosomaticism, which has 25.52 per cent of the total variance. Finally, the fourth factor of social conformity comes which represents 9.41 per cent of the total variance.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

Table 2

The general trends of correlations between reactions to frustration and mental health problems

Reactions to frustration	Early adult age	Middle age	Old age
E—A	+with psychosomatic problems (PU, ANR, UC & Br. A)	+with psychotic and psychoneurotic problems (Sc(s), PD, Pa, AN, OC, CR)	−with psychotic problems (Heb, PD & ScPa)
I—A	−with some of JMPI areas (Heb, Sc(s), Pa, AN, Hy(D), PU & Br. A.)	−with psychotic problems (Sc(s), PD, ScPa & Pa)	−with psychoneurotic problems (AN, Hy(D) & Ne)
M—A	+with psychoneurotic problems (An, CR, Hy(D), & D)	+Heb, Sc(s), ScPa problems −AN, OC, CR problems	+with psychotic problems (Heb, Sc(s), PD, ScPa)
O—D	−with psychotic problems (Heb, PD, ScPa & Pa)	−with PD, ScPa & Pa scales	+with psychotic problems (MD, Sc(s) & ScPa)
E—D	−with PD scale and Hy(D) scale	+with all the psychotic areas (MD, Heb, Sc(s), PD, ScPa & Pa)	+with CR & Ph +with Hy. T. & Br. A.
N—P	+with Heb & Pa and −with ScPa & CR problems	−with psychotic scales (Heb, Sc(s) PD, ScPa & Pa) and with psychoneurotic problems (AN, CR, Ph & Ne)	+with psycho & tomatic (UC, Hy. T. & Br. A.)

\+ =positive association, — =negative association.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

Table 3

The general trends of significance of differences between the hazardous and healthy groups on different areas of JMPI by reactions to frustration

Reactions to frustration	Early adult age	Middle age	Old age
E—A	Hazardous (MD, Heb, OC, Ph, PU & ANR)	Hazardous (Pa & D) Healthy (Ph & PU)	Healthy (MD, Hy(D), D & UC)
I—A	Healthy (MD, Heb, Sc(s), AN, Ph & PU)	Healthy (Pa)	Hazardous (Hy(D), Ne & UC Healthy (OC & Br. A.)
M—A	Healthy (MD, UC & ANR)	Healthy (Pa & D)	Hazardous (Heb & D)
O—D	Healthy (PD, ScPa & Pa)	Healthy (MD, Ph & Hy.T.)	Hazardous (Heb & Ph)
E—D	Hazardous (OC)	Hazardous (MD, Sc(s), Pa & Hy. T.)	Healthy (AN & Ph)
N—P	Healthy (OC & UC)	Healthy (Heb & Pa)	Hazardous (AN) Healthy (Ne)

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

Table 4

The general trends of correlations between family syntality scales and mental health problems

Family syntality scales	Early adult age	Middle age	Old age
FSS—I	+with psychosomatic problems (PU, UC, Hy. T. & Br. A.)	+with psychosomatic problems (PU, UC & Hy. T.)	
FSS—II	+with all the JMPI areas (except CR & D)	+with psychoneurotic problems (OC, CR, Hy.(D), D & Ne)	−with ANR & PU areas +with Hy. T. & Br. A. areas
FSS—III	+with psychosomatic problems (PU, UC, Hy. T. ANR & Br. A.)	+with Ne area	+with D. Ne & UC areas

\+ =positively associated, − =negatively associated.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

Table 5

The General trends of significance of differences between hazardous and healthy groups on different areas of the JMPI by family syntality scales

Family syntality scales	Early adult age	Middle age	Old age
FSS—I	Hazardous (AN, OC, PU & UC)	Hazardous ScPa, OC, PU & Br. A.)	Hazardous (MD, Pa, OC, CR, Hy(D), Ne, ANR & Hy. T.)
FSS—II	Hazardous (MD, Heb, Sc(s). PD, ScPa, Pa, AN, OC, Ph, Ne, ANR, UC, Hy. T., Br. A.)	Hazardous (Heb, PD & D)	Hazardous (AN & OC)
FSS—III	Hazardous (MD, AN, PU, UC & Br. A.)	Hazardous (ScPa, AN, Ne, PU & Hy. T.)	Hazardous (Pa, CR, Hy(D), Ph & Ne)

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

Middle age (Female)

The first factor has 9.47 per cent of the total variance and it is named as factor of psychoneuroticism. The second factor is termed as factor of psychosomaticism which has 19.27 per cent of the total variance. The third factor has taken out 11 56 per cent of the total variance and is identified as factor of psychotic depression. The fourth factor has represented 12.96 per cent of the total variance and termed as factor of psychogenic physical inadequacy. The fifty factor for this group is identified as factor of psychoticism and it accounts for 14.78 per cent of the total variance. Finally the factor of internalized aggression with pseudo community and social conformity comes, which has tapped 11.98 per cent of the total variance.

Old age (Male)

The first factor has tapped 20.07 per cent of the total variance, and it is identified as factor of psychoticism. The second factor accounts for 16.20 per cent of the total variance and termed as factor of psychosomaticism. The third factor has taken out 13.46 per cent of the total variance and is named as factor of psychoneuroticism. The third factor is identified as factor of psychosomaticism, which has 25.52 per cent of the total variance. Finally, the fourth factor of social conformity comes which represents 9.41 per cent of the total variance.

Middle age (Female)

The first factor has 29.47 per cent of the total variance and it is named as factor of psychoneuroticism. The second factor is termed as factor of psychosomaticism which has 19.27 per cent of the total variance. The third factor has taken out 11.56 per cent of the total variance and is identified as factor of psychotic depression. The fourth factor has represented 12.96 per cent of the total variance and termed as factor of psychogenic physical inadequacy. The fifth factor for this group is identified as factor of psychoticism and it accounts for 14.78 per cent of the total variance. Finally the factor of internalized aggression with pseudo community and social conformity comes, which has tapped 11.98 per cent of the total variance.

Old age (Male)

The first factor has tapped 20.07 per cent of the total variance, and it is identified as factor of psychoticism. The second factor

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

accounts for 16.20 per cent of the total variance and termed as factor of psychosomaticism. The third factor has taken out 13.46 per cent of the total variance and avoidance tendency. The seventh factor termed as factor of psychological alienation, it accounts for 11.34 per cent of the total variance.

The comparison of the rotated fectors of middle and old aged males and females against the rotated factors of early adult males and females is given in the following table in a summarized way.

References

D. Amato, M.L. (1979), *Experimental Psychology Methodology, Psychophysics and Learning*, New Delhi, Tata McGraw Hill Publishing Company.

Joshi, M.C. and Malik, A.K. (1981), *Manual of Jodhpur Multiphasic Personality Inventory*. Varanasi, Rupa Psychological Association

Joshi, M.C. and Yadav, D.S. (1975). *Hindi Adaptation of Four Family Syntality Scale*. (Unpublished). Department of Psychology, University of Jodhpur.

Pareek, U., Devi, R.S. and Rosenzweig, S. (1968), *Manual for Indian Adaptation of the Rosenzweig Picture*, Frustration Study Adult Form, Varanasi, Rupa Psychological Corporation.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

Table 6

Comparison of rotated factors of middle and old aged people against the rotated factors of early adult people

	MALE SUBJECTS												FEMALE SUBJECTS											
	E	M	O	E	M	O	E	M	O	E	M	O	E	M	O	E	M	O	E	M	O	E	M	O
MD				2	1	1										2	5	4						
Heb				2	1	1										2	5	4						
Sc(s)				2	1	1										2	5	4						
PD				2	1	1										2	5	6						
ScPa				2	1	1										2	5	3						
Pa				2	1	1										2	5	3						
F				2	1	1										2	5	7						
L				2	–	–				4	4	6										4	5	1
AS				2	–	1																4	6	7
AN	1	2	–										1	1	5							4	3	3
OC	1	2	5										1	1	–									
CR	1	2	5										1	1	–									
Hy(D)	1	2	–										1	1	5									
Ph	1	2	–										1	1	–									
D	1	2	–										1	1	5									
Ne	1	2	5										1	1	5									
SI	1	2	5										1	1	5									
PU							3	3	2										3	2	1			
ANR							3	3	–										3	2	1			
UC							3	3	2										3	2	1			
Hy. T.							3	3	2										3	2	1			
Br. A.							3	3	2										3	2	1			

E = Early adult group, M = Middle age group, O = Old age group.
1 = Factor first, 2 = Factor second, 3 = Factor third, 4 = Factor fourth, 5 = Factor fifth, 6 = Factor sixth, 7 = Factor seventh.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

Faculty of Science

Botany	1—20
Chemistry	1—78
Zoology	1—4
Mathematics	1—4

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

BIOSYSTEMATICS OF BER (*ZIZYPHUS MAURITIANA* LAMK.) CULTIVARS

BRIJ BHUSHAN VASHISHTHA

Abstract of the thesis accepted by the University of Jodhpur
For award of Ph.D. in Botany in the year 1985*

The biosystematic studies on 59 ber cultivars and two wild species i.e. *Zizyphus nummularia* and *Z. mauritiana* var. *rotundifolia* were conducted at the Central Arid Zone Research Institute, Jodhpur. The results are summarised below.

MORPHOLOGICAL STUDIES

1. On the basis of tree growth habit, the cultivars were divided into three major groups, i e. 'Erect', 'Semi-erect' and 'Spreading'. Fourteen cultivars were classified as 'Erect', 19 as 'Semi-erect' and 26 as 'Spreading'. These groups were further divided into 28 sub-groups (9 under 'Erect', 8 under 'Semi-erect' and 11 under 'Spreading'). Further classification of these sub-groups was done using styler end of fruit, leaf apex, cavity in fruit pulp and leaf base at tertiary level. A key to their classification has been prepared.
2. In the cultivars of *Z. mauritiana*, leaf shape varied from oblong, oval, cordate to round, leaf apex from acute, sub-acute to obtuse, leaf base from tapering to broad and petiole length from 0.6 to 2.7 cm. Attempt has been made to resolve the discrepancies in the description of these characters by the previous workers.
3. The cultivars could be divided into two groups on the basis of time of anthesis and dehiscence. Cultivars in the first group with anthesis and dehiscence in the morning between 7 and 8.30 AM were : Seb, Nimaj, Narma, Chhuhara, Ilayachi, Dandan, Jogia, Chonchal, JS II, Triloki, Chencho, ZG-3, Jullundhari, Vikas-2, Sanaur-2, Mirchia, Pebandi Alwar, Ponda, Kheera, Kali, Jhajjar Selection and Meharun. The second group

*This research work was done under the supervision of Dr. O.P. Pareek, Central Arid Zone Research Institute, Jodhpur.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

comprised of cultivars Khatti, Gobindgarh Selection, Kaithali, Lam, Tikadi, Sanaur-1, Sua, Thornless, Narikeli, Banarasi Pebandi, Bahadurgarh, Mundia, Pathan, Banarasi Kadaka, Umran, Katha, Ajmeri, Madhuri, Deedwana, Kala Gola, Noki, Maharwali, Wilayati, Gola, Gola Gudgaon, Popular Gola, Kakrola Gola, Gola Gudgaon-1, Akrota, Gola Gudgaon-3, Katha Phal, Aliganj, Laddu, Safed Rohtak, Bagwadi, Rewa Selection and Sanaur-3 with the anthesis and dehiscence in the afternoon between 12 noon to 2.30 PM.

4. The stigmal receptivity was found to be on the day of anthesis in cultivars Seb, Khatti, Nimaj, Ilayachi, Mundia, Jogia, Pathan, Triloki, Jullundhari, Noki, Pebandi, Alwar, Gola, Kakrola Gola, Gola Gudgaon-1, Ponda, Gola Gudgaon-3, Rewa Selection and it was upto 24 hours after the anthesis in Gobindgarh Selection, Kaithali, Lam, Tikadi, Sanaur-1, sua, Thornless, Narikeli, Narma, Chhuhara, Banarasi Pebandi, Dandan, Bahadurgarh, Chonchal, JS II, Banarasi, Kadaka, Umran, Ajmeri, Katha, Chencho, Madhuri, Deedwana, ZG-3, Vikas-2, Sanaur-2, Kala Gola, Maharwali, Wilayati, Mirchia, Gola Gudgaon, Popular Gola, Akrota, Kheera, Kali, Katha Phal, Aliganj, Laddu, Jhajjar Selection, Safed Rohtak, Meharun, Bagwadi and Sanaur-3.
5. The peak period of flowering occurred in different cultivars between 1st week of September to 2nd week of October. The peak flowering was the earliest in Banarasi Pebandi, Banarasi Kadaka, ZG-3 and Sanaur-3. It was during 1st week of October in Tikadi, Sanaur-1, Narikeli, JS II, Triloki and Meharun and during the 2nd week of October in Laddu and Rewa Selection. The peak flowering in the remaining cultivars was during 2nd to 4th week of September.
6. The peak time of flowering in different cultivars was not found to be related with their time of fruit maturity. Seb, Mundia, Jogia and Gola were found to be early cultivars with peak fruit maturity during first fortnight of January. The cultivars Khatti, Sua, Narikeli, Narma, Pathan, Umran, Ajmeri, Katha, Madhuri, ZG-3, Vikas-2, Maharwali, Mirchia, Ponda, Kheera and Meharun were found to be late cultivars with peak fruit maturity from 10 February. The remaining 39 cultivars had mid season fruit maturity, i.e. during 16 January to 9 February.
7. The description of fruit characters in different cultivars showed that the fruit shape varied from round to oblong, oval, oblate, ovate and obovate, styler end from flat to round, bluntly tapering, obliquely beaked, obliquely pointed and straight

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

pointed; size of fruit from 3.8 g in cultivar Tikadi to 39.5 g in Mundia, pulp/stone ratio from 7 in cultivar Tikadi to 38 in Gobindgarh Selection; total soluble solids from 13° Brix in cultivar Khatti to 25° Brix in Bahadurgarh. Attempt has been made to resolve the discrepancies in the descriptions of fruit characters by the previous workers.

8. The results showed that Umran, Katha and Ajmeri have identical morphological descriptions and were thus considered to be identical.
9. The 'Gola' types were observed to possess distinct morphological features indicating their independent identities.
10. The tree growth habits of *Z. nummularia* and *Z. mauritiana* var. *rotundifolia* were spreading and erect, respectively. The ventral surface of leaf in *Z. nummularia* was tomentose, it was light green in *Z. mauritiana* var. *rotundifolia*. The time of anthesis and dehiscence in both the species was from 7 to 8.30 AM. The fruit size was large (2.5 g) in *Z. mauritiana* var. *rotundifolia* as compared to *Z. nummularia* (1.5 g).

CHEMOTAXONOMIC STUDIES

On the basis of leaf flavonoid pattern, the affinities, relationships and differences in the ber cultivars were brought out in relation to their morphological descriptions.

1. The intra-group relationship of the cultivars showed that under the group 'Erect', Seb and Khatti did not resemble in flavonoid pattern in spite of the similarity in fruit shape (round) in both the cultivars. Similarly, cultivar Sua and Ilayachi under this group also depicted entirely different flavonoid pattern establishing their independent identities.

   Among the cultivars under group 'Semi-erect', Katha, Ajmeri and Umran had identical flavonoid pattern. While under the group 'Spreading' the independent cultivar status of the different 'Gola' types as evidenced by their differing morphological features was confirmed by their distinct flavonoid patterns.
2. The leaf flavonoid patterns of ber cultivars also depicted inter-group relationships between the three morphological groups (Erect, Semi-erect and Spreading). The cultivar Kala Gola, under the group 'Spreading' showed affinity with the cultivars Umran, Katha and Ajmeri of the group 'Semi-erect'. The similarities in the flavonoid pattern of the cultivar Nimaj of 'Erect', Ajmeri, Katha, Umran and Pathan of 'Semi-erect' and Mirchia of 'Spreading' group indicate that these cultivars may

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

have some common parents.

3. On the basis of distinct flavonoid pattern on the two dimensional chromatogram, the following six chemical races from amongst the ber cultivars studied were recognized :
   a) All the flavonoid spots in cultivar Ilayachi had Rf value less than 0.50 in 15% AcOH. Thus all the spots occupied the left half of a two dimensional chromatogram.
   b) Spots of cultivar Pebandi Alwar occupied the right half indicating higher Rf value more than 0.50 in 15% AcOH for all the spots
   c) In cultivar Safed Rohtak all spots occupied the upper half of the chromatogram with Rf value more than 0.50 for all the spots.
   d) The spots of cultivars Wilayati and Sua occupied the lower half of the chromatogram.
   e) Flavonoid spots in cultivars Jullundhari, Mirchia and Lam were found scattered in a band in the centre of the chromatogram.
   f) Spots of Sanaur-3 were found clustering in the centre of the chromatogram.
4. Leaf flavonoid pattern of *Z. nummularia* and *Z. mauritiana* var. *rotundifolia* revealed no relationship with the ber cultivars under study. Both the species also did not have any flavonoid spot in common.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

STUDIES ON THE JURASSIC FLORA OF THE RAJMAHAL HILLS, INDIA–*GYMNOSPERMOUS FRUCTIFICATIONS AND SPORAE DISPERSAE*

O. P. SUTHAR

Abstract of the thesis accepted by the University of Jodhpur
For award of Ph.D. in Botany in the year 1985*

The Jurassic rocks of the Rajmahal Hills, form a part of the Upper Gondwana system of India. These are situated in the Eastern part of the Bihar State between 86.15°—88° longitude and 24°—25.30° latitude and amounting an area of nearly 6400 kilometres.

The area is domiciled by the tribe 'Santhals' and so it is known as Santhal Pargana, Bihar.

The rocks are fresh water deposits preserving plant fossils as impressions and petrifactions. Incrustations are rare. In northern localities the fossils are generally occurring as impressions while in the southern portion, the localities yield petrified fossil plants.

Fossiliferous rocks are exposed at several places in the Rajmahal Hills but for the present purpose plant fossils collected from Sakarigalighat, Sonajori, Nipania and Amarjola have been studied. At Sakarigalighat the fossils are found as impressions while in the remaining three localities—they occur as petrifactions. Sonajori and Nipania possess hard silicified cherts whereas, fossils are found embedded in a ferruginous sandy rock at Amarjola.

Slides were prepared by the usual method of cutting, grinding and polishing techniques. Sections were cut both by diamond edge wheel and wire band saw. Over silicified sections were stained with aqueous safranin, dried and then mounted in canada balsam. Some of the sections were studied

---

*This research work was done under the supervision of Dr. B. D. Sharma, Associate Professor of Botany, University of Jodhpur, Jodhpur.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

under a water film as they become transparent on mounting with canada balsam.

For the study of sporae dispersae, rocks were macerated with HF and HNO_3 but success could not be achieved. The descriptions of spores and pollen grains included in the thesis were studied from the thin sections through the cherts of Sonajori, Hiranduba and Nipania.

ORWO Np—55 (80—ASA), 35mm black and white film was used for photography, Prints were prepared of the bigger sections, directly through the enlarger.

An exhaustive upto date review has been given on the topic including Indian as well as foreign literature.

Description is given of the gymnospermous fructifications belonging to the groups Bennettitales. Pentoxylales and Coniferales. Petrified isolated seeds related to conifers and taxads are also described.

More than 300 spores and pollen grains seen in the thin sections prepared through cherts were studied and described.

The bennettitalean plants include seed bearing fructifications of *Williamsonia* and an unrecorded fructification probably belonging to the genus *Bennettiticarpus*. On the basis of the study of old and fresh collections observations are given on the male fructification *Weltrichea santalerisis*.

More than 300 specimens of *Williamsonia* (naked receptacles, partly preserved and complete fructifications) collected from Amarjola have been studied and on this basis *Williamsonia harrisiana Bose W. amariolense* Sharma are merged into *W. guptai* Sharma, as all the three are morphologically identical and come from a common locality—Amarjola. An emended diagnosis of *W. guptai* is given.

W. guptai has been studied in detail and different stages of early ontogeny and development are included in the thesis. Earlier observations are either confirmed or modified.

Hitherto, unrecorded bennettitalean petrified fructification collected from Amarjola has been described. In shape and size it is identical to *Williamsonia* but internal structure is unpreserved due to silicification. It is related to *Bennettiticarpus* Harris.

More than 50 specimens of *wiltrichia* are present in Dr. Sharma's collection. Some of which are preserved in counter parts. The type specimen was studied at B.S.I.P., Lucknow. Observations of Dr. Sharma (1969) are confirmed. The fructi-

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

fication has two whorls, the outer of bracts and inner of microsporophylls surrounding a cup shaped receptacle. Microsporophylls are twisted bearing two rows of appendages, abaxially in the proximal portion and on the lateral side in distal half.

Weltrichia companulatiformis Sharma is a distinct species and should not be merged with *W. santalensis* Sith. and Bose (1971).

Seed bearing fructifications *(Carnocontites)* of the pentoxyleae were collected from Nipania as well as Sonajori. *C. compactum* and *C. laxum* are two distinct species which may be separated on shape and size of the fructification, morphology of seeds, nature of integument and presence or absence of dark staining cells in sarcotesta adjacent to sclerotesta.

Renaming of *Carnoconites laxum* Sriv, as *C. rajmahalensis* (Wieland) Bose, Pal and Harris (1984) is criticised as the decision is not based on the study of well preserved specimens. The genus *Carnoconites* was established on the internal structure of the seed, while Bose et al. suggested the change in name merely on the basis of the study of external morphology of two poorly preserved specimens, and collected not from the original locality Nipania but from Sakarigalighat and Onthea.

Further observations are given on *Sahnia nipaniensis* Mittre and a new restoration is attempted. The fructification possesses a long cylinderical receptacle producing simple or branched, microsporophylls in spirals. Sporangia are opposite and each produces a large number of boat shape or circular spores with reticulate or irregular exine.

A number of petrified coniferous seed bearing (*Nipaniostrobus, Nipanioruha, Mehtaia* and *Araucarites*) and pollen producing *(Podostrobus)* fructifications are described. These are related to Podocarpaceae and Araucariaceae. In addition to further observations on their morphology, relationship with allied plants is discussed.

Further observations are given on *Nipaniostrobus sahnii, Nipanioruha granthia, Mehtaia nipaniensis, M. rajmahalensis, Araucarites mittrii* and *Podostrobus sahnii*. Some of the specimens could not be assigned to their respective species either for want of material or poor preservation of material. Such specimens are *Mehtaia* sp., *Podostrobus* sp. etc.

The curved micropyle in Podocarpaceous ovules is related with the multisaccate spores of this family.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

A number of petrified cones of *Araucarites mittrii* collected from Sonajori are described. These are the best preserved specimens of *Araucarites*, sor far described from India. Further observations have been given on the morphology and anatomy of *A. mittrii* Bohra and Sharma. It shows the mixed characters of the sections *Bunya* and *Eutacta* of the genus *Araucaria*.

A number of petrified, isolated gymnospermous seeds collected from Sonajori have been described in detail. Their relationship is discussed with conifers and taxads. In some of the seeds, aril is clearly preserved. However, their associated vegetative organs are yet to be discovered.

Isolated seeds described are *Pakuriospermum pachytestoides, Paradoxispermum heterotestoides, Taxaliospermum arilloides, Triangulospermum minimi* and *sonajorispermum homotestoides.*

A preliminary study of sporae dispersae has been included in the thesis, on the basis of the study of thin sections prepared through the cherts from Hiranduba, Sonajori and Nipania localities.

Hiranduba chert is over silicified and preserves only few kinds of spores e.g. *Cicatricosisporites* and *Contignisporites.* These are generally found in groups enclosed in a body. However, details of the body could not be seen clearly.

At Sonajori, the spores of *Clcatrscosisporites* are found in Schizaeaceous sporengia. In some of the alides biwinged podocarpaceous pollen grains could also be seen.

Nipania chert is very rich in spores and pollen grains, specially the yellowish - brown matrix of the rock. Biwinged pollen grains occur more frequently than the Pteridophytic species, Cycadaceous spores also occur commonly in this chert.

The following genera of spores and pollen grains are included in thesis : *Lycopodiumsporites, Osmundacidites, Gleicheniidites, Cicatricosisporites, Cyathidites, Alsophilidites, Cyatheacidites, Contignisporites, Setosisporites Cycadopites, Microcachrydites, Podocarpidites* and *Araucaricites.*

Contionisporites sp. and *Cycadopites couperi* are reported for the first time from the Rajmahal Hills and their presence favour upper Jurassic to Lower Cretaceous age of the area.

At a number of places, the gaps in our knowledge about the Jurassic flora of the Rajmahal Hills are pointed out. It is proposed to bridge the gaps by continuing further investigations on the extinct plants from this area.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

INTERCROPPING FODDER AND GRAIN LEGUMES WITH A RAINFED PERENNIAL GRASS *CENCHRUS CILIARIS* Linn.

MAHANDER SINGH

Abstract of the thesis accepted by the University of Jodhpur
For award of Ph.D. in Botany in the year 1985*

The important findings of the study are summarised as follows :

YIELD PRODUCTIVITY AND ECONOMIC FEASIBILITY

i) The fact that yields of *C. ciliaris* from two planting geometries i.e. regular and paired rows were statistically at par, suggest that intercropping of kharif legumes can be practised in the inter-pair spaces of the latter. The legume intercrop yield would thus be a bonus.

ii) Higher dry fodder yield was obtained from legume grass intercropping systems as compared to pure grass. This brings out that total tonnage output can be increased by introducing legume intercrops in the sown pastures.

iii) The increased fodder yields from grass-legume systems were not only due to the additional yields of legume components but also due to the complementary effects of legumes on the grass component. Among fodder legumes—moth bean and grain legumes—cluster bean, proved to be most advantageous in increasing the yield of grass by 11 per cent.

iv) Highest combined yield of dry fodder was obtained from the association of moth bean—grown either for grain or fodder, with grass. The increase was 15 to 18 per cent over the yield of pure grass, caused by both additive and complementary effects of the moth beans in the system. This shows that moth bean is the most adaptable and compatible intercrop for sown pastures of *C. ciliaris* in the arid zone.

v) Apart from better nutrient build up and release, the moisture use efficiency was also higher in grass-legume

*This research work was done under the supervision of Dr. R.P. Singh of the Central Arid Zone Research Institute, Jodhpur.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

mixtures than pure grass. Moth bean—grass combination gave the highest soil moisture use efficiency and it was the system which gave the highest combined yield. Grasses being deep rooted could extract moisture also from the deeper layers—including substratum, thus causing more efficient use of rain water entering into the soil.

vi) Land equivalent ratio and staple land equivalent ratio were highest for the systems having fodder moth bean and grain moth bean as intercrops. Accordingly, farm land could be best utilised by adopting intercropping systems in such soil-climatic situations.

vii) All the inter-cropping systems showed better economic returns than pure grass. Grass-moth bean systems proved to be most remunerative. In so far as the net return per rupee of variable cost is concerned, it was only the grass+grain moth bean system that gave higher net benefits than pure grass.

QUALITY CHARACTERISTICS

i) *Crude protein* : Though the total output of crude protein was relatively higher from intercropping systems as compared to pure grass, significant difference in this respect were observed only in one year i.e. 1983.

The systems having moth bean and cluster bean for fodder were more promising in this regard.

ii) *In-vitro dry matter digestibility* : IVDMD values showed the same trend as that of crude protein content for there was a positive correlation between the two parameters. Grass-fodder cluster bean and grass-fodder moth bean mixtures were significantly superior than other systems in this respect.

iii) *Cell wall constituents* : This being a negative parameter for quality, lower values for these stand for better quality fodder. Accordingly, coefficient of correlation between crude protein and cell wall constituents was negative.

All mixtures had lower cell wall constituents than pure grass. Increase in the proportion of legumes in the mixture was associated with a significant reduction in cell wall constituents. Mixtures having fodder legumes showed better quality than grain legumes as the values for cell wall constituents were lower in case of the former.

Grass + cluster bean in fodder and grass + moth bean in

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

grain legume groups showed relatively lower values of cell constituents than other mixtures.

iv) *Content of minerals* : Concentration and uptake of N, P, K, Ca and Mg were higher in mixtures than pure grass. Grass-cluster bean mixtures excelled over others in this regard.

The foregoing clearly reveals that intercropping of leguminous crops in sown pastures is remunerative enterprise. The advantage is not just limited to increased production of better quality forage but the system also ensures long range conservation and efficient utilization of land and water resources in the arid zone.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

PALYNOTAXONOMY OF ZYGOPHYLLACEAE

ARUNA MATHUR

Abstract of the thesis accepted by the University of Jodhpur
For award of Ph.D. in Botany in the year 1985*

Family Zygophyllaceae (*sensu-lato*) being an assemblage of heterogenous elements, is in a conflicting state of classification. The traditional morphological characters being insufficient to have a commonly accepted and agreed classification of this family, recourse has been taken on pollen morphological characters to see if it could serve any purpose to obtain a more acceptable and reasonably homogenous classification of this family. Present investigation was, therefore, undertaken: (i) To prepare the Pollen Flora of Zygophyllaceae on the world basis, (ii) To identify the species and genera of Zygophyllaceae on the basis of pollen characters, (iii) To obtain a cautious taxonomic evaluation of various characters of the taxa involved, (iv) To assess the existing classification of Zygophyllaceae mainly on morphological and palynological grounds, (v) To study the evolutionary trendsin the pollen of Zygophyllaceae, (vi) To study the phylogeny of the family Zygophyllaceae and its various sub-families and tribes, on the bases of above mentioned studies.

The material for the present study was mainly collected from the different herbaria of the world. The pollen slides have been prepared by the acetolysis method (Erdtman 1952). In addition the pollen of different genera were subjected to SEM technique. The genera of the family studied have been arranged according to Engler's (1931) system of classification. The terminology have been followed after Erdtman and Vishnu-Mittre (1956-1958) and also Praglowski (1979). Under each genus the description of the pollen grains has been given for the first species only but measurements and the differences in the pollen morphology if any from the first species has been given under other species

*This research work was done under the supervision of Dr. M.M. Bhandari, Professor of Botany, University of Jodhpur, Jodhpur.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

of the genus. Authentic voucher specimens from which the pollen material has been taken are cited along with the herbarium from which it has been taken. References of photos, both ordinary microphotographs and SEM photographs, as well as text figures have been given at appropriate places under each species.

Robert Brown (1814) was the first botanist to place all the taxa under one head Zygophylleae, named by later taxonomists as Zygophyllaceae. Taxonomists are of divergent views regarding the classification of this family. Endlicher (1849) divided the family Zygophyllaceae into 6 sub-families, and Bentham and Hooker (1862) and Willis (1966) divided the family into two groups without assigning any name. Engler (1931) published the most comprehensive treatment of the family known up to date. He recognised the family to comprise of 7 sub-families viz. *Peganoideae, Chitonioideae, Tetradiclidoideae, Augeoideae, Zygophylloideae, Nitrarioideae* and *Balanitoideae*. Takhtajan (1959) separated *Nitrarioideae* and *Balanitoideae*. Porter (1969, 1972) constituted the sub-family *Tribuloideae* including in it the sub-tribe *Tribulinae* only of Engler *(loc. cit.)* in Hadidi (1975) separated tribe *Tribuleae* of Engler as a separate family *Tribulaceae*. He (1975) also supported the treatment of *Nitraria, Balanites, Peganum* and *Tetradiclis* as separate families *Nitrariaceae, Balanitaceae, Peganaceae* and *Tetradicliaceae*.

The pollen of *Zygophyllaceae* has been studied for first time by Koelrenter (1811). Since then number of workers (Hadidi, (1975), Bhandari and Parveen (1979) and Mathur and Bhandari (1982) studied the palynology of the family but the earlier studies are at smaller level.

The some total of evidences from morphological characters indicate that the family *Zygophyllaceae* consists of heterogenous elements.

The first 3 sub-families of Engler *(loc. cit.)* are characterised by their capsular or splitted fruits while the last two sub-families have drupaceous fruits. The first 3 sub-families represent extreme with alternate leaves. While the two succeeding sub-families represent another extreme with drupaceous fruits.

The geographical distribution of the family *Zygophyllaceae* shows that the family has its maximum development in Kalahari-Namib desert, where the family is represented by 10 genera. Petagonian desert with two genera, has the least representation

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

of *Zygophyllaceae*. The genera *Kelleronia, Malacocarpus, Plectrocarpa, Pintoa, Sericodes, Sisyndite* and *Viscainoa* have restricted distribution in particular deserts. The distribution of *Zygophyllaceous* genera in various desert can be correlated with various pollen types as mentioned below :

1. North American Desert : 3-zonicolpate, reticulate *Morkillia* and *Viscainoa*, 3-zonicolporoidate, reticulate *Porlieria*, 3-zonicolporate, reticulate (*Sericodes*, *Larrea*, and *Neoschoretera*), 3-zonicolporate, retibaculate *Fagonia*, 3-zonicolporate, foveolate *Guaiacum* and panporate, retipilate *Kallstroemia*.
2. Sahara Desert : 3-zonicolporate with striate exine (*Tetradiclis* and *Nitraria*).
3. Iranian Desert : 3-zonicolpate, psilate (*Seetzenia*), 3-zonicolporate, reticulate (*Peganum*, *Bulnesia* and *Larrea*) and 3-zonicolporate, striate (*Nitraria*).
4. Arabian Desert : 3-zonicolpate, psilate (*Seetzenia*) 3-zonicolporate, retibaculate (*Fagonia*), 3-zonicolporate, striate (*Tetradiclis*) and panporate, retipilate (*Kelleronia*).
5. Turkestan Desert : 3-zonicolporate, striate (*Balanites*, *Tetradiclis*, *Nitraria*), 3-zonicolpate, retibaculate (*Fagonia*), 3-zonicolpate, reticulate (*Miltianthus* and *Peganum*).
6. Thar Desert : 3-zonicolpate, psilate (*Seetzenia*), 3-zonicolporoidate, reticulate (*Zygophylum*), 3-zonicolporate, reticulate (*Peganum*), 3-zonicolporate, foveolate (*Guaiacum*), 3-zonicolporate, retibaculate (*Fagonia*), 3-zonicolporate, striate (*Nitraria* and *Balanites*) and panporate, retipilate (*Kallstroemia* and *Tribulus*).
7. Australian Desert : 3-zonicolporoidate, reticulate (*Zygophylum*), 3-zonicolporate, striate (*Nitraria*).
8. Kalahari-Namib Desert : 3-zonicolpate, psilate (*Seetzenia*), 3-zonicolpate, reticulate (*Sisyndite*), 3-zonicolporoidate, reticulate (*Zygophyllum*), 3-zonicolporate, retibaculate (*Fagonia*), 3-zonicolporate, reticulate (*Augea, Peganum, Neoluederitzia*), 3-zonicolporate, striate (*Balanites*) and panporate retipilate (*Kallstroemia, Tribulus*).
9. Patagonian Desert : 3-zonicolporate, reticulate (*Plectrocarpa*, *Bulnesia*).
10. Atacama Peruvian Desert : 3-zonicolporate, reticulate (*Pintoa, Larrea, Bulnesia*), 3-zonicolporate, retibaculate (*Fagonia*).

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

It is clear from above description that perhaps the main sight of origin of *Zygophyllaceae* is in the Kallahari-Namib desert, since all pollen morphotypes found in *Zygophyllaceae* are meet in that region.

Pollen grains has long been correlated with the phyllogeny of different taxa right from the time when the pollen and spore morphology was brought to time-light. Of all the pollen characters the germinal apearture has been found to be of utmost importance in tracing the phylogeny. It can be concluded that possibly the parallel evolution of different pollen morphological characters occur. *Seetzenia* having 3-zonicolpate pollen and psilate exine appears to be most primitive and possibly have given rise to colpate and reticulate pollen of *Viscainoa*, *Sisyndite* and *Morkillia*.

These genera might have, in turn given rise to colporate pollen with reticulate exine. The panporate pollen grains of *Tribulus*, *Kallstrocmia* and *Kelleroenia* might have evolved from colporate form by reduction of colpi and division and dispersal of pores or the ancestral stock of this form has to be looked outside the *Zygophyllaceous* taxa.

Survey reveals the eurypalynous nature of the family *Zygophyllaceae*. Seven distinct pollen types based on aperture and exine ornamentation characters have been recognised, out of the 91 species of 25 geners studied here. All the sub-families of Engler (1931) have been studied. The pollen morphotypes each sub-families are :

1. *Peganoideae* : (*Peganum* and *Malacocarpus*)
This sub-family includes 2 genera i.e. *Peganum* and *Malacocarpus*. The pollen grains in both the genera are 3-zonicolporate and reticulate.

2. *Tetradiclidoideae* : (*Tetradiclis*)
This sub-family includes monotypie genus *Tetradiclis*. Its pollen grains are 3-zonicolporate and striate with lo-longate os.

3. *Chitonioideae* : (*Morkillia*, *Viscainoa*, *Sericodes*)
The genera included in this sub-family reveal two types. Genus *Morkillia* and *Viscainoa* have 3-zonicolpate pollen grains but in *Scricodes* the pollen in 3-zonicolporate.

4. *Augeoideae* : (*Augea*)
This sub-family includes monotypic genus *Augea* in which pollen grains are 3-zonicolporate, fossaperturate with reticulate exine.

5. *Zygophylloideae* : This sub-family is further divided into two tribes : i.e., *Zygophylleae* and *Tribuleae*.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

i) Tribe : *Zygophylleae* : The tribe is further divided into 2 sub-tribes.

a) *Fagoninae* : (*Fagonia* and *Seetzenia*)
Two pollen morphotypes are found in this sub-tribe i.e., *Fagonia*-type with colporate and retibaculate exine and *Seetzenia*-type with colpate and psilate exine.

The *Fagonia* spp. can be grouped into two viz., one with circular os (*Fagonia indica*-type) and the other with lo-longate os (*F. cretica*-type). The species having *F. indica* pollen types differ amongst themselves in relative thickness of exine.

b) *Zygophyllinae* : (*Bulnesia*, *Guaiacum*, *Larrea*, *Millianthus*, *Neoschoretera*, *Pintoa*, *Plectrocarpa*, *Porlieria* and *Zygophyllum*).

Two pollen morphotypes are evident in this sub-tribe. *Zygophyllum*-type (3-zonicolporoidate) and *Larrea*-type (3-zonicolporate). *Zygophyllum* and *Porlieria* are included in *Zygophyllum* pollen type. Pollen of *Zygophyllum* itself shows two pollen types one with circular os and the other with lo-longate os. In the *Larrea*-type, *Guaiacum* is different from other genera in having foveolate exine.

ii) Tribe : *Tribuleae* : This tribe is further divided into two sub-tribes.

a) *Neoluederitzinae* : (*Neoluederitzia* and *Sisyndite*)
The genera included in this sub-tribe show two different apertural characters. In *Sisyndite* grains are 3-zonicolpate, while in *Neoluederitzia*, pollen grains are 3-zonicolporate.

(b) *Tribulinae* : (*Kelleronia*, *Kallstroemia*, *Tribulus* and *Tribulopsis*)

Two pollen morphotypes are evident in this sub-tribe : *Kelleronia*-type with duplibaculute muri and *Tribulus* type with simplibaculate muri. *Kallstroemia* has the second type, but no material of *Tribulopsis* could be studied.

6. *Nitraroideae* : (*Nitraria*)

The pollen of *Nitraria* is 3-zonicolporate with striate exine.

Two pollen morphotypes are recognised in *Nitraria*, viz., *Nitraria retusa*-type with circular os and *N. sibarica*-type with lolongate os.

7. *Balanitoideae* : (*Balanites*)
The pollen of *Baanites* is 3-zonicolporate, fosso-aperturate with striate exine.

A key for the identification of the studied species of Zygophyllaceae on the basis of pollen morphology has been prepared.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

The pollen morphology is very useful to suggest the reclassification of family *Zygophyllaceae*.

Thus the main outlines of the proposed classification of *Zygophylaceae* are as follows :

Sub-family I—*Peganoideae*
Genera :—1. *Peganum*
2. *Malacocarpus*

Sub-family II—*Morkillioideae*
Genera :—1. *Morkillia*
2. *Viscainoa*

Sub-family III—*Augeoideae*
Genus :—1. *Augea*

Sub-family IV—*Zygophylloideae*

Tribe— 1. *Seetzeneae*

Sub-Tribe a) *Seetzeniineae*
Genus : *Seetzenia*

Sub-Tribe b) *Sisynditiineae*
Genus : *Sisyndite*

Tribe— 2. *Zygophylleae*

Sub-Tribe a) *Zygophyllyniineae*
Genera : *Bulnesia*, *Guaiacum*, *Larrea*, *Miltianthus*, *Neoluederitzia*, *Neoschoretera*, *Pintoa*, *Porlieria*, *Sericodes*, *Zygophyllum*.

Sub-tribe—b) *Fagoniineae*
Genus : *Fagonia*

It has been suggested to separate sub-tribe *Tribulineae* as a distinct family *Tribulaceae*.

The main outlines of the proposed classification of *Tribulaceae* are as follows :

Family : *Tribulaceae*

Tribe —*Kelleroneae*
Genus : *Kelleronia*

Tribe —*Tribuleneae*
Genera 1. *Tribulus*
2. *Kallstroemia*

Similarly it is also suggested that family *Balanitoideae* should be regarded as a distinct family *Balanitaceae*. *Tetradiclidoideae*

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

and *Nitrarioideae* may either be separated as two families or may be kept in one family and placed in the order *Rutales* along with *Rutaceae*. It is best to place *Balanitaceae* with *Simaroubaceae* and *Zygophyllaceae*.

Nearly 6.5 per cent of taxa have 3-colpate pollen, 22.2 per cent have 3-colporoidate pollen, 50.5 per cent have 3-colporate pollen and 20.8 per cent have panporate pollen types.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

STUDIES ON CHEMICAL SPECTROSCOPY

VIKRAM KUMAR NARULA

Abstract of the thesis accepted by the University of Jodhpur
For award of Ph. D. in Chemistry in the year 1985*

The influence of pH and the presence of surfactants on the optional behaviour of some dyes and fluorescent compounds has been investigated. Correlation between the spectral changes and structure of compounds has been discussed.

DYES OF XANTHENE GROUPS

Rose Bengal

Influence of pH on the absorption spectrum of rose-bengal dye has been investigated. The absorption spectrum of the dye showed maximum absorbance at 550 nm in its aqueous solution [pH=6.6]. On lowering the pH of the dye solution (from pH 6.6 to pH=1.4) a decrease in the absorbance as well as in the colour intensity of the dye solution was noticed and the solution became colourless at pH = 1.4. However the absorbance and the intensity of the colour remained unaffected on increasing the pH of the dye solution (from pH = 6.6 to pH = 12.43).

On lowering the pH of the dye solution the ionic form of the dye changes into the acidic form and at very low pH the quinonoid form converts into the benzenoid form. This results in disappearance of the colour of the dye. The structure of the dye remains unaffected by increasing the pH of the solution.

Phloxine-B

Aqueous solution of the dye displayed an absorption peak at 548 nm at pH—6.08. As the pH of the dye solution was decreased the absorbance and the colour intensity of the dye solution was also decreased. At very low pH (pH=1) the solution became colourless. On increasing the pH of the dye solution (from pH=6.08 to pH=13.05) no change in the absorbance was noticed.

*This research work was done under the supervision of Prof. R. C. Kapoor, Head of the Chemistry Department, University of Jodhpur, Jodhpur.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

In strongly acidic medium the quinonoid form of the dye is completely absent and the dye solution becomes colourless. On the other hand, on increasing the pH of the solution, the dye structure as well as the colour intensity remains unaffected.

The behaviour of phloxine-B appears similar to that of rose-bengal since both the dyes have similar structures.

DYES OF ACRIDINE GROUPS

ACRIDINE-ORANGE

Aqueous solution of acridine-orange showed an absorption peak at 503 nm (pH = 5.93). On increasing the pH of the dye solution (form pH = 5.93 to pH = 13.10), there occurred a decrease in the absorbance as well as in the colour intensity of the dye solution. In the higher pH region i.e. pH = 10.00 to pH = 12.00 the λ_{max} shifted towards shorter wavelength (from 503 nm to 450 nm). On the other hand the absorbance and the colour intensity remained unaffected by lowering the pH of the solution (from pH = 5.93 to pH = 1.2).

The spectral changes can be correlated to changes occurring in the structure of the dye molecule. At higher pH HCl from the hydrochloride form of the dye is removed and the ionic form of the dye converts into the non-ionic form resulting in a change in the colour of the dye and a shift towards shorter wavelength.

DYES OF TRIPHENYL METHANE GROUPS

ANILINE BLUE

Influence of pH

Aqueous solution of aniline blue displayed an absorption peak at 595 nm at pH = 8.10. Enhancement in the absorbance as well as the colour intensity of the dye solution was observed on decreasing the pH of the solution (from pH = 8.10 to pH = 1) while on increasing the pH of the solution (from pH = 8.10 to pH = 13.10) the absorbance of the dye decreased continuously and the solution became colourless at pH = 13.10.

Changes in the pH of the dye solution cause structural changes in the dye. At very high pH the quinonoid form becomes absent resulting in a colourless solution. On the other hand at low pH the absorbance and the intensity of the solution increases due to the presence of the stable form.

Influence of Surfactants

(a) Initially at low concentrations the non-ionic surfactants (TX—

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

100, Tween—40, or Tween—80) decreased the absorbance of the dye but the same was increased subsequently on increasing the concentration of the surfactant. Eventually the optical density of the dye at its λ_{max} became higher than its original value.

(b) During initial addition of the anionic surfactants (SLS, DBSS or DSSS) the absorbance of the dye decreased but the same increased subsequently in presence of higher amount of the surfactant.

(c) On the addition of cationic surfactants (CPB, CPC or CDBAC) the absorbance of dye decreased till the dye solution became almost colourless in the presence of higher concentration of surfactant.

In presence of anionic or non-ionic surfactant, the dye first seems to aggregate within the surfactant micelle It then disaggregates into monomeric form on increasing the surfactant concentration which results in an increase in the absorbance of the dye solution. An interaction between the anionic dye and cationic surfactants appears to take place resulting in a continuous decrease in the absorbance of the dye solution.

FUCHSIN ACID

Fuchsin acid displayed an absorption peak at 551 nm at a pH= 5.55; with the increase in the pH of the dye solution (from pH= 5 55 to pH=13.05) a decrease in the absorbance took place and at higer pH (pH=12 and above) the solution became colourless. On the other hand, lowering the pH of the solution (from pH=5.5 to pH=1.3) resulted in an increase in the absorbance and the colour intensity of the dye solution.

The changes appear to be due to the structural changes occurring in the dye molecule. At higher pH the quinonoid form of the dye converts into the bezenoid form, resulting in a colourless solution. On the other hand on lowering the pH of the dye solution, the resonance structure of the dye becomes prominent resulting in a greater stability and an increase in the colour intensity of the dye solution.

ANTHRANILIC ACID

Influence of non-ionic, cationic and anionic surfactants on the fluorescence behaviour of anthranilic acid has been investigated.

(a) The non-ionic surfactants (except TX—100) increased the fluorescence intensity alongwith a shift of excitation and emission peaks towards longer wavelength. Triton X—100

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

initially decreased the fluorescence intensity and then increased the same in presence of higher concentration of the surfactant. A shift in λ_{max} towards longer wavelength also occurred.

(b) Addition of anionic surfactant caused a decrease in the fluorescence intensity of the compound. The intensity subsequently stabilised in presence of higher amounts of the surfactant. No shift in peak wavelength was observed.

(c) On adding cationic surfactants, a decrease in the fluorescence intensity of the compound took place which reached a constant value in the presence of higher amounts of surfactant. A shift of 30 nm in the λ_{ex} was also observed. However the λ_{em} remained the same.

It appears that the non-ionic surfactants interact with the dimer form of the acid and break it up into the monomeric form. This results in a shift of excitation and emission wavelengths and an increase in the fluorescence intensity. The initial decrease in fluorescence intensity on adding TX—100 may be due to some interaction of the compound with the surfactant molecules. The anionic surfactants appear to react with the liberated H^+ of the -COOH group of the compound and the cationic surfactants react with the $-NH_2$ group of the compound. Due to these interactions the fluorescence intensity decreases in both the cases and it becomes constant in presence of higher concentrations of surfactants due to non availability of the $-NH_2$ and -COOH groups of the compound.

QUININE

The fluorescence behaviour of quinine has been investigated in presence of non-ionic, cationic and anionic surfactants.

(a) The non-ionic surfactants (except TX—100) caused an increase in the fluorescence intensity of quinine without causing any shift in its excitation and emission peaks. However, the behaviour of TX—100 was somewhat different. It first increased fluorescence intensity which on further addition of the surfactant was decreased and reached a limiting value.

(b) The fluorescence intensity of quinine is initially decreased on the addition of anionic surfactants (DBSS and DSSS). Subsequently it increased on further addition of surfactant. Concurrently a shift took place in λ_{ex} and λ_{em} by 32 nm and 25 nm respectively. On the other hand Aerosol-OT and SLS initially increased the fluorescence intensity which was decreased subsequently on increasing the concentration of

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

the surfactant. However the excitation and emission wavelengths remained unaffected.

(c) Cationic surfactants initially increased the fluorescence intensity but the same decreased in presence of higher surfactant concentration. No change was observed in the excitation and emission wavelengths.

The enhancement in fluorescence intensity in the presence of non-ionic surfactants (Tween-40 or Tween-80) appears to be due to the solublization of quinine particles. The exceptional behaviour of TX-100 may be due to the formation of micelle or complex in presence of higher concentration of surfactant. The anionic surfactants (DBSS and DSSS) react with the π-electrons of quinine resulting in the formation of a complex with consequent shift in excitation and emission peaks. In the presence of higher amounts of surfactant the quinine gets solublised in the surfactant micelle. The other anionic surfactants (Aerosol – OT and SLS) show exceptional behaviour. It appears that at higher concentration the surfactants modify the geometry of the molecule resulting in a decreased intensity of fluorescence.

Quinine molecules get solublized in presence of low concentration of cationic surfactants resulting in an increase in its fluorescence intensity. A possible H-bonding between surfactant and quinine molecules may be taking place in the presence of higher amounts of surfactant resulting in a decrease in the fluorescence intensity.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

SPECTROSCOPIC STUDIES OF DYES AND SOME LUMINISCENT COMPOUNDS IN PRESENCE OF SURFACE ACTIVE AGENTS

MILAP CHAND GOUD

Abstract of thesis accepted by the University of Jodhpur
For award of Ph. D. in Chemistry in the year 1985*

The effect of cationic, anionic and non-ionic surfactants on the fluorescence and absorption spectra of Acridine yellow, Congo red, Umbelliferone, β-methyl umbelliferone and Riboflavin has been studied. Various types of effects have been observed and the findings of each compound are given individually.

ACRIDINE YELLOW

The absorption intensity increased during the initial addition of the non-ionic surfactants. With increasing concentration, the peak height decreased and the absorption maximum shifted towards longer wavelength. The results are interpreted in terms of complex formation between dye and the surfactant micelle (as the changes are observed to occur above the cmc).

Cationic surfactant (cetyl pyridinium bromide) reduced the peak height initially with a red shift in the absorption maximum of acridine yellow. On increasing the surfactant concentration, the peak height increased slightly. However, at still greater concentrations of the surfactant absorption intensity again decreased along with a blue shift in the absorption maximum.

These variations have been explained in terms of repulsion of similar charges of the dye and surfactant molecules and high magnetic polarity of Br^-. The peak shift is interpreted in terms of excitation of the π-electrons to triplet state and reorientation in the geometry of the acridine yellow.

The anionic surfactant (sodium lauryl sulphate) initially enhanced the absorption intensity of the dye along with a shift in λmax to higher wavelength region. The peak height reduced very slightly at higher concentrations of the surfactant. The results have been

*This research work was done under the supervision of Dr. R.C. Kapoor, Prof. and Head of the Department of Chemistry, University of Jodhpur, Jodhpur.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

interpreted in terms of formation of complex molecule as a result of interaction between oppositely charged dye and surfactant molecules.

CONGO RED

The non-ionic surfactants decreased the fluorescence intensity of congo-red abruptly which remained unaffected (except for very minute variations in peak height) on further addition of the surfactant. A shift in excitation maximum was also observed on adding non-ionic surfactants. The changes have been explained in terms of absorption of the surfactant micelle on the photo-receptor part of the dye

On the addition of cationic surfactants quenching of emission intensity was observed which ultimately became zero at higher concentration of the surfactant. However, the wavelengths of excitation and emission peaks remained unchanged. The quenching is assumed to take place because of adsorption of the dye molecule on the surfactant micelle.

UMBELLIFERONE

Initially the non-ionic surfactants decreased the peak height which was subsequently enhanced with the addition of more surfactant. In no case any shift in λmax of the fluorescing compound was noted. In some cases the initially decreased peak height remained unchanged on further addition of the surfactant. The changes appear to occur due to modification of the excited neutral molecule to its isomer. The change of the isomeric form appears to be governed by the change in pH occurring due to the addition of the surfactant.

The cationic surfactants initially decreased the emission intensity which was subsequently enhanced on increasing the surfactant concentration. In some cases the subsequent increase exceeded the emission intensity of the pure solution of umbelliferone. The observations have been explained on the basis of change in the isomeric forms of the compound and solubilisation of umbelliferone at the first and second criticle micelle concentration of the surfactant.

The anionic surfactants initially decreased the peak height of the umbelliferone. However emission intensity was subsequently enhanced in the presence of higher concentrations of the surfactant. The effects have been interpreted in terms of formation of sub-micellar complex with more than one molecule of the umbelliferone

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

and also due to change in the concentration of the photochemically active isomer of umbelliferone.

β-METHYL UMBELLIFERONE

The non-ionic surfactants first decreased the emission peak height of the molecule. Subsequently on further addition of the surfactant some enhancement occurred but finally the peak height was decreased. In some cases enhancement was observed during initial addition of the non-ionic surfactant. All the variations have been attributed to the interconversion of the two isomers of β-methyl umbelliferone.

On adding cationic surfactants enhancement in the emission intensity of β-methyl umbelliferone was observed which was followed by a decrease in intensity. The position of the excitation and emission peaks were also altered. The observed changes have been explained in terms of interaction of the hydrophilic part of the surfactant with the fluorescing molecule resulting in solubilisation of the molecule within the surfactant micelle.

Anionic surfactants greatly enhanced the emission intensity of the compound. A slight decrease in peak height was observed at an intermittant concentration. The variations have been explained to occur due to solubilisation of β-methyl umbelliferone in the surfactant micelle above its cmc and also due to interaction between the oppositely charged molecules of the surfactant and β-methyl umbelliferone below the cmc range of the surfactant. Also change in the isomeric forms of β-methyl umbelliferone seems to play a role in altering its spectral behaviour.

RIBOFLAVIN

The surfactants seems to have a minor influence on the fluorescence behaviour of riboflavin.

With the addition of non-ionic surfactants, the emission intensity decreased initially and then a slight increase in peak height was observed at higher concentration of the surfactant However, in some cases the decreased peak height became stable. The decrease in peak height appears to be due to the adsorption of the fluorescing molecule on the surfactant micelle, as a result of which the planarity of the molecule gets distorted.

In the cases of cationic surfactants the observed variations are similar to that of non-ionics.

Except sodium lauryl sulphate, other anionic surfactants show similar influence. Addition of sodium lauryl sulphate resulted in an increase in the emission peak height. It is likely that a specific

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

interaction occurs between the hydrophilic part of the surfactant and the photo receptor part of riboflavin.

Other anionics decrease the peak height initially and then stabilise it to a limiting value; still others again increase the emission intensity very slightly. The effects are interpreted in terms of adsorption and desorption of surfactant micelles on riboflavin.

INFLUENCE OF TEMPERATURE ON CRITICLE MICELLE CONCENTRATION OF THE SURFACTANTS

The cmc of non-ionic, cationic and anionic surfactants, was evaluated by plotting surface tension of the surfactant against the corresponding concentration and extrapolating the straight and the descending parts of the curve to the point of intersection. The surfactant concentration corresponding to the intersection point was taken as its cmc. The surface tension was calculated by the weight drop method using a stalgnometer. The experiments were repeated at different temperatures using a constant temperature bath. The cmc was found to change with temperature in most of the cases. However, in some cases the cmc was found to remain unchanged at different temperature. This may be due to insufficiently large temperature spreads selected for the study and the relative shortness of the lipophilic chain of the surfactant.

An increase in temperature is supposed to reduce the interfacial tension (between the hydrocarbon chain of the surfactant and the polar water molecules) in case of surfactants where an increase in cmc is observed with rise in temperature. Decreased interfacial tension, in turn, reduces the free energy of the system. Hence the process of micellisation is delayed (as micellisation occurs to oppose the increase in free energy). However, this alone may not be the governing factor for the change. Other factors which can effect cmc with change in temperature are—

[1] change in electrostatic and electrokinetic forces,

[2] change in the solubility of the surfactant,

[3] change in isomeric forces of the surfactant,

In a few cases, the cmc decreased with temperature. This phenomenon is relatively less frequent and may be attributed to the change in the number of monomers forming the micelles. However another possibility is that the monomer micelle equilibrium may cease to exist and result in a stepwise aggregation of surfactant molecules. Consequently the variation of surface tension may become more or less gradual (in contrast to the sudden change which is a characteristic indication of micellisation). Sufficiently large temperature spreads and selection of more compounds

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

can reveal more interesting facts and can explain the observed facts in better way. The cmc of various surfactants at different temperatures is tabulated in Table.

S.No.	Surfactant	Criticle at 15°C	Micelle at 25°C	Concentration at 15°C
1.	DBSS	0.068	0.022	0.014
2.	DSSS	0.023	0.024	0.024
3.	Tween-80	0.01	0.012	0.014
4.	Brij-35	0.052	0.024	0.033
5.	Tx-100	0.024	0.025	0.037
6.	CDBAC	0.01	0.012	0.012
7.	CPC	0.01	0.01	0.01
8.	SLS	0.02	0.02	0.02
9.	Tween-60	0.015	0.017	0.017
10.	CPB	0.022	0.009	0.008

An effort has been made to correlate the observed spectral changes in the fluorescing molecule with the cmc of the surfactants. In many cases the spectral behaviour changed abruptly above the cmc, whereas in other cases the cmc does not seem to play a leading role in spectral changes. However due to change in the environment of the micelle in presence of fluorescing compounds the cmc of the surfactant can slightly alter.

Moreover, any change in spectral behaviour of the fluorescing compounds, which occurs at a concentration above cmc, can be due to the interaction of the micelle with the fluorescing molecule. This change may not be in the vicinity of the cmc.

Once the process of micellisation has started micelles continue to grow in size and change in shape up to a concentration, beyond which their degeneration starts. Therefore, any concentration which falls in the range of cmc and micelle deformation can effect the dye spectrum.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

KINETICS AND MECHANISM OF THE OXIDATION OF ORGANIC COMPOUNDS

A. L. JAIN

Abstract of the thesis accepted by the University of Jodhpur
For award of Ph. D. in Chemistry in the year 1985*

The chemistry of positive halogen organic compounds, including N-metallo-N-haloarylsulphonamides has attracted much attention recently due to the diverse nature of molecular transformations brought about by this group of reagents[1]. The oxidation of organic compounds by sodium-N-chlorotoluenesulphonamide (Chloramine-T or CAT) has been reported widely but reports about the kinetics of the oxidations by its benzene analogue—sodium-N-chlorobenzenesulphonamide (Chloramine-B or CAB) are rather scanty. It is known that the kinetics obtained in oxidation of alcohols by CAT[2] and CAB[3] are different. Therefore, we took up the mechanistic study of the oxidation of organic compounds by CAB. The chief objectives of this work were two. First to elucidate the mechanism of the reaction of CAB with α-hydroxy acids and diols. Secondly to study the structure-reactivity correlations in these reactions.

The thesis comprises of four chapters. The first chapter reviews the present day knowledge about the oxidation by N-metallo-N-halogenoarylsulphonamides. The experimental procedures are described in the second chapter. The oxidation of substituted mandelic acids forms the subject matter of the third chapter. The oxidation of diols are described in the fourth chapter.

KINETICS AND MECHANISM OF THE OXIDATION OF MONO SUBSTITUTED MANDELIC ACIDS BY CHLORAMINE-B

Not much information is available about the mechanism of oxidation by CAB except that of alcohols[3]. It is known that with several positive halogen compounds alcohols[4] and hydroxy acids[5] follow different mechanisms. This prompted us to undertake the present investigation.

*This research work was done under the supervision of Dr. K.K. Banerji, Associate Professor of Chemistry, University of Jodhpur, Jodhpur.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

The substituted mandelic acids were prepared by the reported method[6]. α-Deuteriomandelic acid was prepared by the method of Kemp and Waters[7]. CAB was prepared by the chlorination of benzenesulphonamide in an alkaline solution[8]. The reactions were followed, under pseudo-first-order conditions, iodometrically. The solvent was 1:1 (v/v) acetic acid-water, unless mentioned otherwise.

The oxidation of mandelic acid by CAB in the presence of perchloric acid results in the formation of phenylglyoxylic acid (PGA). PGA was isolated as its 2,4-dinitrophenyl-hydrazone (DNP) in 70% yield after recrystallization. The oxidation of the hydroxy acids exhibited a 1:1 stoicheiometry. The overall reaction may be written as follows :

$$PhSO_2NCl^- + PhCH(DH)COOH \longrightarrow PhSO_2NH_2 + Cl^- + PhCOCOOH \quad (1)$$

The reaction is of total third order, being first order with CAB, mandelic acid and hydrogen ions. The rate law for the reaction is given by eq. (2)

$$-d[CAB]/dt = k[CAB][H^+][\text{Mandelic acid}] \quad (2)$$

The reaction is not affected by radical scavangers like allyl acetate and failed to induce polymerisation of acrylonitrile in an atmosphere of nitrogen. Thus a one-electron mechanism may be discounted.

To ascertain the importance of the cleavage of α-C-H bond in the rate-determining step, the oxidation of α-deuteriomandelic acid was studied. The value of primary isotope effect, k_H/k_D, is 5.13 ± 0.06 at 303 K.

The oxidation of mandelic acid was studied in 95% deuterium oxide solution. The solvent isotope effect $k(H_2O)/k(D_20) = 0.406$ at 303 K. Thus an involvement of the hydroxy group in the slow step or the pre-equilibria is unlikely.

The effect of solvent composition was studied in binary solvent mixture or acetic acid and water. The reaction rate increases slightly with increasing proportion of acetic acid in the solvent. Addition of benzenesulphonamide does not affect the rate. The rate of oxidation of mandelic acid and nine m- and p-monosubstituted mandelic acids were determined at four different temperatures, and the activation parameters were evaluated.

The following equilibria are possible in an acidified CAB solution.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

$$PhSO_2NCl^- + H_3O^+ \rightleftharpoons PhSO_2NHCl + H_2O \quad (3)$$

$$2PhSO_2NHCl \rightleftharpoons PhSO_2NCl_2 + PhSO_2NH_2 \quad (4)$$

$$PhSO_2NHCl + H_2O \rightleftharpoons PhSO_2NH_2 + HOCl \quad (5)$$

$$PhSO_2NCl_2 + 2H_2O \rightleftharpoons PhSO_2NH_2 + 2HOCl \quad (6)$$

The probable oxidising species are $PhSO_2NHCl$, $PhSO_2NCl_2$ and HOCl. However, dichloramine-B ($PhSO_2NCl_2$) can be ruled out as the reactive species in view of the strict first order dependence on CAB. Further, no effect of benzenesulphonamide precludes both $PhSO_2NCl_2$ and HOCl as oxidizing species. $PhSO_2NHCl$ is, therefore, the most probable oxidising species.

The large primary kinetic isotope effect confirms that the rate-determining step involves cleavage of the C-H bond from the carbon bearing the functional groups.

The rate of oxidation of ten mandelic acids correlate very well with Brown σ^+ values with a reaction constant $\rho^+ = -2.13$ ($r = 0.9935$) at 303 K. The large negative reaction constant and the substantial deuterium isotope effect indicate a considerable carbonium ion character in the transition state. The above results thus suggest a hydride ion transfer in the rate—determining step.

$$Ph-\underset{COOH}{\overset{OH}{C}}--H + Cl-NHSO_2Ph \xrightarrow{slow} PhC^+(OH)\,COOH + HCl + PhSO_2NH^- \quad (7)$$

$$PhSO_2NH^- + HCl \xrightarrow{fast} PhSO_2NH_2 + Cl^- \quad (8)$$

$$PhC^+(OH)\,COOH \xrightarrow{fast} PhCOCOOH + H^+ \quad (9)$$

KINETICS AND MECHANISM OF THE OXIDATION OF DIOLS BY CHLORAMINE-B

The oxidation of alcohols by CAB has been reported from our laboratory recently[3]. It is, however, known that with several oxidants, e.g., lead tetraacetate and periodic acid[9], monohydric alcohols and diols follow different mechanistic pathways. We, therefore, undertook a study of the kinetics of oxidation four vicinal diols, three non-vicinal diols and 3-methoxybutan-1-ol by

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

CAB in 1:1 (v/v) acetic acid-water solution, in the presence of perchloric acid.

The diols and 3-methoxybutan-1-ol were commercial products. Ethanediol-1, 1, 2, 2-d_4 was prepared by the reduction of diethyl oxalate by lithium aluminium deuteride[10]. The reactions were followed iodometrically.

The oxidation of vicinal diols results in the formation of products by the cleavage of glycol bond. The other diols and 3-methoxybutan-1-ol yield carbonyl compounds formed by the simple oxidation of hydroxyl group (eqs. 11 and 12).

$$R_2C(OH)\text{-}C(OH)R_2 + PhSO_2NCl^- \longrightarrow 2R_2CO + PhSO_2NH_2 + Cl^- \quad (11)$$

$$ROCH_2(CH_2) - CH_2OH + PhSO_2NCl^- \longrightarrow ROCH_2-(CH_2)_n-CHO + Cl^- + PhSO_2NH_2 \quad (12)$$

(where R = H or Me; n = 1 or 2).

The rate law for the oxidation of diols and 3-methoxy butan-1-ol is given by eq. (13).

$$-d[CAB]/dt = k\,[CAB]\,[H^+]\,[Diol] \quad (13)$$

The oxidation of diols, in an atmosphere of nitrogen failed to induce polymerisation of acrylonitrile. Thus a one-electron oxidation giving rise to free radicals is unlikely.

The deuteriated and ordinary ethanediol react with almost equal rates showing that a primary kinetic isotope effect is absent.

The oxidation was studied in 95% deuterium oxide. The solvent isotope effect, $k(H_2O)/k(D_2O)$, at 298 K is 7.61 and 0.39 for the oxidation of ethanediol and propane-1, 3-diol respectively.

The oxidation rates were obtained at four different temperatures and the activation parameters were calculated.

Added benzenesulphonamide has no effect on the reaction. This observation and linear dependence of the rate on acidity are reminiscent of the results obtained in the oxidation of mandelic acid and show that in the oxidation of diols also the reactive oxidising species is $PhSO_2NHCl$.

The diverse nature of the products formed and the different values of solvent isotope effect suggest that vicinal diols and other diols follow different mechanisms. This is confirmed by the formation of two different linear plots between activation entropy and enthalpy, one for the vicinal diols and another for the rest.

The absence of a primary kinetic isotope effect confirms that in ethanediol α-C-H bond is not cleaved in the rate-determining step.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

The isolation of products formed by the rupture of C-C bond and the observed solvent isotope effect confirms that the oxidation takes place by the rupture of the glycol bond and that the hydroxyl groups are involved in the slow step. The following mechanism has been proposed.

$$\begin{array}{l} R_2-C-O-H \\ \quad\;\; | \\ R_2-C-O-H \end{array} + \begin{array}{l} Cl \\ | \\ NHSO_2Ph \end{array} \xrightarrow{\text{slow}} 2R_2CO + PhSO_2NH_2 + H^+ + Cl^- \qquad (14)$$

The rate of oxidation increases sharply with progressive substitution of hydrogen atoms of ethanediol by methly groups because of increase in steric relief in more substituted diols on oxidation.

The activation enthalpies and entropies of non-vicinal diols correlate with those of 3-methoxybutan-1-ol, a typical monohydric alcohol. This observation and isolation of hydroxy carbonyl compounds suggest that non-vicinal diols behave like monohydric alcohols towards CAB. This is further supported by the almost identical values of solvent isotope effect obtained in the oxidation of propane-1,3-diol and ethanol[11]. Therefore, it is proposed that the oxidation of non-vicinal diols also involves a hydride-ion transfer in the rate-determining step as in the oxidation of alcohols[3, 11].

References

1. Campbell, M.M. & Johnson, G. (1978), *Chem. Rev*, 78, 65.
2. Banerji, K.K. (1977), *Bull. Chem, Soc. Jpn.*, 50, 1616.
3. Mukherjee, J. & Banerji, K.K. (1980), *J. Chem. Soc. Perkin Trans.* 676.
4. Venkatsubramanian, N. & Thiagarajan, V. (1969), *Can. J. Chem.*, 47, 694.
5. Barakat, H.Z. & Abdul-Wahab, M.F. (1953), *J. Amer. Chem. Soc.*, 75, 5731.
6. Vogel, A.I. (1964), *Practical Organic Chemistry*, Longmans Green and Co., Ltd., 1194.
7. Kemp, T.J. & Waters, W.A. (1964), *J. Chem. Soc.*, 1192.
8. Chrzaszczewska, A. (1952), *Bull. Soc. Sci. at letters Lodz Classe III*, 3, 16; *Chem. Abst*, (1955), 49, 212.
9. Wiberg, K.B. (1965), *Oxidation in Organic Chemistry*, Part A, Academic Press, New York, Ch. 5 and 6.
10. Kemp, T.J. & Waters, W.A. (1963), *Proc. Roy. Soc. Ser. A.*, 274, 480.
11. Mukherjee, J. & Banerji, K.K. (1981), *Indian J. Chem. Sec. A.*, 20, 394.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

STUDIES ON PROTON DISSOCIATION REACTIONS IN AQUEOUS AND NON-AQUEOUS MEDIA

GHANSHYAM LAL RAI

Abstract of the thesis accepted by the University of Jodhpur
For award of Ph.D. in Chemistry in the year 1985*

Some amino acids have been selected for the present studies, wherein their dissociation behaviour has been investigated and an attempt has been made to observe the changes brought about by varying the ionic strength and temperature. The medium chosen for the study is 50 wt.% aqueous methanol because studies in partially aqueous media have not yet been made extensively and enough remains to be understood and interpreted. Knowledge of their dissociation constants enhances the prospects of proper use of amino acids in the field of medicine, industry and chemistry.

In this study, an attempt has been made to determine the two acid dissociation constants, $pKa_{(COOH)}$ and $pKa_{(NH_3)}$ for the chosen eight amino acids.

(1) GLYCINE
(2-amino ethanoic acid) $H_2N.CH_2.COOH$

(2) α-ALANINE
(2-amino, propanoic acid) $CH_3.CH(NH_2).COOH$

(3) β-ALANINE
(3-amino, propanoic acid) $NH_2.(CH_2)_2.COOH$

(4) VALINE
(2-amino, 3-methyl butanoic acid)
$CH_3.CH(CH_3).CH(NH_2).COOH$

(5) PHENYL-ALANINE
(2-amino, 3-phenyl, propanoic acid) $C_6H_5.CH(NH_2).COOH$

(6) BICINE
[N, N-bis (2-hydroxyethyl) – glycine]
$(HO.CH_2.CH_2)_2.N.CH_2.COOH$

---

*This research work was done under the supervision of Prof. R.C. Kapoor, Head of the Chemistry Department, University of Jodhpur, Jodhpur.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

(7) TRICINE
[N(trishydroxymethyl) – methyl]–glycine
$(HOCH_2)_3.C.NH.CH_2.COOH$

(8) LYSINE
(2, 6–diaminohexanoic acid) $NH_2.(CH_2)_4.CH(NH_2).COOH$

The $pKa_{(COOH)}$ or pKs_1 denotes the equilibrium constant for the equilibrium

$$\underset{\text{Cation I}}{H_3\overset{+}{N}.R.COOH} \rightleftharpoons H^+ + \underset{\text{Zwitter ion II}}{H_3\overset{+}{N}.R.COO^-} \qquad (1)$$

while, the $pKa_{(-\overset{+}{N}H_3)}$ or pka_2 corresponds to the equilibrium

$$\underset{\text{II}}{H_3\overset{+}{N}.R.COO^-} \rightleftharpoons H^+ + \underset{\text{Anion III}}{H_2N.R.COO^-} \qquad (2)$$

To determine these two dissociation constants, the amino acids, which usually occur in the zwitter-ionic form II, were first protonated to change them to I, which has been the starting species in the titrations conducted (the case of lysine necessited a deviation, which is discussed below). During titrations, employing alkali as the titrant, the two equilibria (1) and (2) having equilibrium constants K_1 and K_2 respectively, are successively established in acidic and in alkaline media and involve removal of protons from $-COOH$ and $-\overset{+}{N}H_3$ groups respectively. Obviously pKa_1 and pKa_2 are the acid dissociation constants of protonated amino acids and the non-protonated species respectively.

EXPERIMENTAL

Potentiometry has been preferred by the author for these studies. It has wider range of applicability and is less time-consuming. The pH-metric titration technique employed involves measurement of EMF of a cell composed of two half cells (each usually referred to as an electrode) under the preselected conditions of temperature and ionic strength. These were glass electrode and the saturated calomel electrode (SCE). The potential difference between two such electrodes, taken in a cell, is a function of the hydrogen ion activity in the solution taken in the first half cell, (containing glass electrode) as given by the expression,

$$\log_{10} a_{H+} = pH = \frac{Eo - Ec}{0.0591} \text{ at } 25°C \qquad (3)$$

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

where Eo is the observed potential and Ec is the potential of SCE under the experimental conditions.

METHODOLOGY

The pH titrations were performed using the procedure described in the literature.* The $\bar{n}_H$, (the average number of proton associated with amino acid) values were calculated at various pH, from the data obtained during the pH– titrations by employing the Irving-Rossotti formula.** Formation (pH vs $\bar{n}_H$) curves were plotted and from them, the two acid dissociation constants $pKa_{(COOH)}$ and $pKa_{(-\overset{+}{N}H_3)}$ were obtained from the pH axis at the $\bar{n}_H$ values of 1.5 and 0.5 respectively. These were also calculated from the relations

$$pKa = pH - \log\left(\frac{2-\bar{n}}{\bar{n}-1}\right) \tag{4}$$

$$\text{and } pKa = pH - \log\left(\frac{1-\bar{n}}{\bar{n}}\right) \tag{5}$$

respectively. Good agreement was noticed in the values obtained by these two methods. In the case of lysine these relations (1) and (2) gave respectively, $pKa_{(\alpha-\overset{+}{N}H_3)}$ and $pKa_{(w-NH_3)}$, while $pKa_{(COOH)}$ was calculated using the relation

$$pKa = pH - \log\left(\frac{3-\bar{n}}{\bar{n}-2}\right) \tag{6}$$

Graphically $pKa_{(COOH)}$ was obtained from the formation curve at $\bar{n}_H$ values of 2.5. For complete protonation of lysine, double the equivalent amount of the perchloric acid was added.

$$\underset{\underset{NH_3}{|+}}{H_2N.(CH_2)_4.CH.COO^-} \xrightarrow[\text{protonation with } HClO_4]{2H^+} \underset{\underset{NH_3}{|+}}{H_3\overset{+}{N}.(CH_2)_4.CH.COOH} \tag{7}$$

*Kapoor, R.C. and Soni, M.L., International J. Quantum Chemistry, 20, (1981) 385.

**Irwing, H.M. and Rosotti, H.S., J. Chem. Soc., (1953) 3397; (1954) 2904.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

The divalent cation thus formed was then titrated against the titrant alkali. The equilibria, successively established were :

$$\overset{+}{H_3N}.(CH_2)_4.CH(\overset{+}{NH_3}).COOH \overset{K_1}{\rightleftharpoons} \overset{+}{H_3N}.(CH_2)_4.CH(\overset{+}{NH_3}).COO^- \quad (8)$$

$$\overset{K_2}{\rightleftharpoons} \overset{+}{H_3N}.(CH_2)_4.CH(NH_2).COO^-$$

$$\overset{K_3}{\rightleftharpoons} H_2N.(CH_2)_4.CH(NH_2).COO^-$$

INSTRUMENTATION

A Radiometer (Copenhagen, Danmark) automatic titrator (Type TTT–1d) and the SBU–1a syringe burretts assembly were used in conjunction with a titrigraph (Type SBR–2c) to automatically record the titration curves between pH and the volume of the titrant added. The electrode assembly contained, as stated earlier, a glass electrode and a SCE, which worked as the indicator (or working) electrode and reference electrode respectively. They were supplied by Radiometer Co., Copenhagen and were of type G2028 and K401 respectively. An ultra-thermostate bath (MTA, Kutesz, Budapest, Hungary, E-149), having an automatic electric relay for temperature control, was used to provide thermostated water at the desired temperature, for circulation in the double-walled titration cell.

The calibration of the instrument (pH meter titrator : TTT-1d) was done always with the phosphate and oxalate buffers, that have been recommended for the 50 wt.% aqueous methanol medium.

MATERIALS

All the amino acids were procured from Sigma Chemical Company (USA) and were used without further purification. Methanol A.R. (BDH) was distilled before being used. Sodium perchlorate (Reidel, Germany) and all other chemicals used were of A.R. grade. Triple distilled CO_2– free water was used. All solutions were prepared in 50 wt.% aqueous methanol medium.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

THERMODYNAMIC PARAMETERS

These were obtained using the relation

$$pKa = \frac{\Delta H}{2.303RT} - \frac{\Delta S}{2.303\ R} \qquad (9)$$

The pKa values were plotted against $\frac{1}{T}$. A linear curve emerged; the slope (m) and intercept (C), of this straight line were used in the relations :

$$\Delta H = 2.303\ R.m \qquad (10)$$

and $\Delta\ S = -2.303\ R.c$ (11)

to calculate ΔH and ΔS and these in turn gave ΔG through the expression

$$\Delta G = \Delta H - TDS \qquad (12)$$

RESULTS

The pKa values of the amino acids, numbered 1 to 8 earlier, are given respectively in Tables 3.19, 4.19, 5.13, 6.13, 7.13, 8.19, 9.19 and 10.14.

The pKa values were determined at three ionic strengths (0.1, 0.5 and 1.0) and at temperatures varying from 23 to 50°C. The pKa values obtained at 30°C are given in the following table. The thermodynamic parameters are given in Table 11.01.

DISCUSSIONS

All the amino acids that have been investigated, with the exception of lysine, behave as dibasic acids in strongly acidic solution and thus give two dissociation constants. The first one corresponds to the ionization of the carboxylic group and the second to the protonated amino group. The positive charge of the latter attracts electrons and hence strengthen the nearby acidic group causing greater ionization of the carboxylic group. This results in lowering the pKa as compared to that for the corresponding simple carboxylic acids, e.g. acetic acid.

Conversely, the ionization of the carboxylic group creates a negative charge, which in turn produces acid-weakning effect. The protonated amino group therefore becomes weaker acids and thus pKa_2 should rise. Such is the case, in aqueous medium, wherein $-\overset{+}{N}H_3$ group of glycine gave pKa value of 9.9 while a value of 7.7 was observed for amino group of the corresponding methyl ester.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

Comparison with values in aqueous medium

These values are higher than those obtained for the respective amino acids in aqueous solutions. The addition of methanol to water is known to suppress the ionization due to the decrease in the dielectric constant (ϵ) of the medium which would lead to higher pKa values. This appears to be true for the $pKa_{(COOH)}$.

On the other hand the $pKa_{(\overset{+}{N}H_3)}$ values are lower in aqueous methanol systems, (exception β–alanine). Since the equilibrium associated with it [viz. $H_3\overset{+}{N}.R.COO^- \rightleftharpoons H^+ + H_2N.R.COO^-$] involves conversion of cationic ($-\overset{+}{N}H_3$) group to ($-NH_2$), coulombic attraction is not expected to play a significant role. On the other hand, the basicity of the medium may determine the extent to which such a protolysis would proceed. Another contributing factor may be that in such a medium of low dielectric constants ($\epsilon = 56.3$ at 25°C) the zwitterions can partially rearrange themselves into their uncharged isomers.

At much lower ionic strengths an increase in both the pKa value is expected to occur. In 50 mass% aq.-methanol such a pattern has reportedly been observed in the pKa values obtained by extrapolation to zero ionic strength, at 25°C. The strong effect of water in stabilizing the zwitter-ion thus continue in 50 wt.% of methanol medium also at zero ionic strength. However under our experimental conditions, i.e. at higher ionic strengths, the basicity of the medium encourages dissociation of the second proton in 50% methanol medium which leads to lower pKa_2 values. Such a decrease in pKa_2, in the case of glycine, has been attributed to (i) interactions between water in the mixed solvent aud ionic charge sites such as the anion [$H_2N.R.COO^-$] and H^+ and (ii) the stabilization of the zwitter ion [$H_3\overset{+}{N}.R.COO^-$] through hydrogen bonding interactions with water.

The effect of temperature and ionic strengths

The pKa values tend to decrease with the rise in temperature and that these decrease to a little extent, with the increase in ionic strength. Moreover the pKa value of β–alanine and phenylalanine have been compared to those of glycine, α–alaline and valine and variations have been explained in terms of inductive effects etc. The values for lysine have been compared with those reported in other media.

The pKa values of bicine and tricine are lower than those of glycine at corresponding ionic strengths and temperatures.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

While comparing the basicity of tricine and glycine it can be argued that the substitution of bulky hydrophilic tris-(hydroxymethyl) methyl-group on nitrogen atom of glycine increases the dissociation of both the carboxyl group and the protonated amino group. This enhancement in strength is attributed to the steric as well inductive effects. The change is more pronounced in pKa_2 values, probably because the substituent is adjacent to the protonated nitrogen but relatively removed from the carboxylic group. Similar effects are operative with bicine also.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

The pKa values determined at 30°C

Amino acids→ Ionic strength I ↓	Glycine	α–alanine	β-alanine	Valine	Phenyl alanine	Bicine	Tricine	Lysine
				$pKa_{(COOH)}$				
0.1	3.00	2.95	4.10	2.95	2.80	(2.20)	2.45	2.35
0.5	2.75	2.65	3.80	2.70	2.50	2.05	(2.05)	(1.95)
1.0	2.65	2.50	3.55	2.50	2.45	(1.60)	(2.10)	1.75
				$pKa(_{\alpha\text{-}3}\overset{+}{N}H_3)$				
0.1	9.00	9.20	9.45	9.10	8.70	7.75	7.85	8.50
0.5	8.95	9.15	9.05	9.00	8.35	7.75	7.65	8.20
1.0	8.95	9.00	8.95	8.75	8.15	7.35	7.50	8.00
				$pKa_{(NH_3)}$				
0.1								10.10
0.5								9.80
1.0								9.50

(The values in brackets were obtained by the extrapolution of the formation curve)

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

VOLTAMMETRIC STUDIES IN POLLUTION CONTROL

(Cyclic Voltammetric Behaviour of Some Toxic Metal Ions)

PRADEEP KUMAR SHARMA

Abstract of the thesis accepted by the University of Jodhpur
For award of Ph.D. in Chemistry in the year 1985*

The author has made a voltammetric study of some heavy metal ions at different concentrations, such as Pb(II), Cd(II), Zn(II) and Eu(III), in sodium chloride, sodium nitrate, sodium perchlorate, sodium sulphate, sodium acetate and sodium thiocyanate media. The concentration of supporting electrolytes was kept 0.1 *M* in all the cases. Further the reduction process of Fe(III) ion has been investigated in 1.0 *M* perchloric acid medium. Cyclic voltammetric technique was employed to study and evaluate the systems. Hanging mercury drop electrode was used as the working or indicator electrode for studying the reduction behaviour of Pb(II), Cd(II), Zn(II) and Eu(III) metal ions while Fe(III)/Fe(II) system was studied at a platinum indicator electrode. A study of complexation reaction of Zn(II) with bicine as well as tricine has been made. The complexation reaction of Eu(III) with EDTA has also been studied.

Theory and applications of cyclic valtammetry have been discussed in Chapter I. This includes a literature survey of the studies undertaken on Pb(II), Cd(II), Zn(II) and Eu(III) at a hanging mercury drop electrode. The work already done on Fe(III)/Fe(II) system at platinum and glassy carbon electrodes have also been given.

A brief description of the experimental set-up, methods and other details have been given in Chapter II.

In Chapter III, cyclic voltammetric studies of Pb(II) in different sodium salts as supporting electrolytes with different concentrations of Pb(II) has been described. The supporting electrolytes

---

*This research work was done under the supervision of Prof. R.C. Kapoor, Head of the Chemistry Department, University of Jodhpur, Jodhpur.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

used were sodium chloride, sodium nitrate, sodium perchlorate, sodium acetate and sodium thiocyanate. The studies have indicated the reversible nature of the reduction process of lead into its metallic state. The reduction process was found to be diffusion controlled. It was noted that the formal potential values, calculated as the average of cathodic and anodic peak potentials agreed fairly with the reported values of its half wave potentials in the respective media using D.C. polarographic technique. The data are given in Table S-1 and S-2.

Cyclic voltammetric study with different concentrations of Cd(II) in presence of various sodium salts as supporting electrolytes has been described in Chapter IV. The electrolytes employed were sodium chloride, sodium nitrate, sodium sulphate, sodium acetate, and sodium thiocyanate. The reduction behaviour of Cd(II) appeared reversible in most of the conditions studied. The process was found to be controlled by diffusion process. The peak potential difference or separation between cathodic and anodic peaks was dependent on the scan rate. Also the peak potential values were more negative in sodium acetate and sodium thiocyanate as compared to other supporting electrolytes. The formal potential values, calculated as the average of cathodic and anodic peak potentials also agreed fairly with the half-wave potentials in the respective media using D.C. polarographic technique (Table S-3 and S-4).

In Chapter V the author has described the cyclic voltammetric behaviour of Zn(II) in different supporting electrolytes. The specific influence of the anions of supporting electrolytes (chloride, nitrate, sulphate, perchlorate, acetate and thiocyanate) on the electro-chemical behaviour of Zn(II) has been investigated. The calculated values of its heterogeneous rate constant in all the cases have been found to be in the range of quasi-reversible region. The process was also found to be controlled by diffusion (Table S-5 and S-6).

Chapter VI includes the cyclic voltammetric study of Zn(II)-bicine and Zn(II)-tricine complex systems. An effort was made to evaluate the composition and stability of the complex systems employing the technique of cyclic voltammetry. It was observed that the peak potentials of Zn(II) shifted towards more negative direction on increasing the concentration of bicine or tricine. The observed shifts in peak potential values were employed to evaluate the composition and overall formation constants of Zn(II)-bicine and Zn(II)-tricine complexes. The calculated

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

values of overall formation constants agree fairly well with earlier reported values (Table S-7 and S-8).

In Chapter VII the cyclic voltammetric study of Eu(III) in presence of various sodium salts as supporting electrolytes has been given. The supporting electrolytes used were sodium chloride, sodium nitrate, sodium perchlorate, sodium sulphate, sodium acetate and sodium cyanate. The specific influence of anions of the supporting electrolytes on the electrochemical behaviour of Eu(III) has been noted and carefully investigated. The calculated values of heterogeneous rate constant and other parameters in all the cases indicated the irreversible nature of the reduction process (Table S-9 and S-10).

The behaviour of europium in presence of EDTA has also been described in the same chapter. It was observed that peak potential of europium shifted towards more negative direction on increasing the concentration of EDTA, while the peak potential difference decreased on increasing the concentration of EDTA. This showed the complexing behaviour of europium(III) with EDTA. It also indicated that the electron transfer process was facilitated on complexing europium with EDTA (Table S-11).

In Chapter VIII a cyclic voltammetric study of the reduction of Fe(III) using platinum indicator electrode has been given. The author had made a detailed study of its reduction process in perchloric acid as supporting electrolyte. On the basis of peak potential difference and heterogeneous rate constants the reduction process was found to be irreversible in nature at the platinum indicator electrode. The reduction process was also found to be controlled by diffusion (Table S-12).

Table S-1

Cyclic voltammetry of Pb(II) in different supporting electrolytes

Scan Rate 40 mv/sec Concentration of Pb(II) 4×10^{-4} *M*

Supporting electrolytes 0.1 *M*	E_{pc} volts	E_{pa} volts	ΔE mv	I_{pc} μA	I_{pa} μA	I_{pa}/I_{pc}	E_p volts
NaCl	−0.450	−0.415	35	2.10	4.40	2.09	−0.432
$NaNO_3$	−0.445	−0.410	35	1.35	3.05	2.25	−0.427
$NaClO_4$	−0.440	−0.400	40	1.10	2.62	2.30	−0.420
NaSCN	−0.460	−0.425	35	1.70	3.30	1.94	−0.442
Na.acet	−0.480	−0.450	30	1.55	2.90	1.87	−0.465

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

Table S-2

Variation of I_{pc} with $V^{\frac{1}{2}}$ in different supporting electrolytes (Pb II)

$V^{\frac{1}{2}}$	I_{pc} in microamperes				
	0.1 *M* NaCl	0.1 *M* $NaNO_3$	0.1 *M* $NaClO_4$	0.1 *M* NaSCN	0.1 *M* Na.acet.
0.200	3.8	3.4	2.9	4.2	3.3
0.223	4.1	4.1	3.3	4.9	3.7
0.244	4.8	4.6	3.7	5.6	4.1
0.262	5.2	4.8	4.0	6.1	4.4
0.282	5.7	5.2	4.3	6.7	4.6
0.300	6.0	5.5	4.6	7.1	5.1
0.316	6.3	5.7	4.7	7.2	5.1
0.331	6.7	6.1	5.1	7.6	5.4
0.346	7.1	6.3	5.3	7.8	5.8

Table S-3

Cyclic voltammetry of Cd(II) in different supporting electrolytes

Scan Rate 40 mv/sec Concentration of Cd(II) 1×10^{-4} *M*

Supporting electrolytes 0.1 *M*	E_{pc} volts	E_{pa} volts	ΔE mv	I_{pc} μA	I_{pa} μA	I_{pa}/I_{pc}	E_f volts
NaCl	−0.660	−0.625	35	0.525	1.10	2.00	−0.642
$NaNO_3$	−0.638	−0.605	33	0.525	1.05	2.00	−0.621
Na_2SO_4	−0.655	−0.620	35	0.600	1.07	1.79	−0.637
Na.acet	−0.663	−0.628	35	0.550	1.10	2.00	−0.645
NaSCN	−0.665	−0.630	35	0.600	1.25	2.08	−0.647

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

Table S-4

Variation of I_{pc} with $V^{\frac{1}{2}}$ in different supporting electrolytes (Cd II)

$V^{\frac{1}{2}}$	I_{pc} in microamperes				
	0.1 *M* NaCl	0.1 *M* $NaNO_3$	0.1 *M* Na_2SO_4	0.1 *M* Na.acet	1.0 *M* NaSCN
0.200	4.7	4.3	4.3	4.9	4.6
0.223	5.3	5.1	5.0	5.5	5.3
0.244	5.9	5.7	5.5	6.1	5.7
0.264	6.4	6.2	6.0	6.7	6.2
0.282	6.8	6.8	6.9	7.2	6.9
0.300	7.2	7.2	7.2	7.7	7.7
0.316	7.7	7.5	7.6	7.9	8.2
0.331	8.2	7.9	8.1	8.5	8.7
0.346	8.8	8.3	8.4	8.8	9.4

Table S-5

Cyclic voltammetry of Zn(II) in different supporting electrolytes

Scan Rate 40 mv/sec Concentration of Zn(II) 1×10^{-3} *M*

Supporting electrolytes 0.1 *M*	E_{pc} volts	E_{pa} volts	ΔE mv	I_{pc} μA	I_{pa} μA	I_{pa}/I_{pc}
NaCl	−1.060	−1.010	50	3.8	7.4	1.94
$NaNO_3$	−1.065	−1.003	62	4.2	8.8	2.09
Na_2SO_4	−1.083	−1.033	50	4.1	8.8	2.10
$NaClO_4$	−1.060	−1.003	57	3.9	8.7	2.23
Na.acet	−1.080	−1.010	70	3.4	7.5	2.20
NaSCN	−1.088	−0.998	90	4.0	7.6	1.90

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

Table S-6

Calculated values of heterogeneous rate constants Ks of Zn(II) in different supporting electrolytes at scan rate 100 mv/sec

Supporting electrolytes 0.1 *M*	$V^{\frac{1}{2}}$ volts/sec	$\triangle E_p x n$ mv	Ψ	$Ks \times 10^3$ cm/sec
NaCl	0.316	90	0.75	8.2
$NaNO_3$	0.316	125	0.35	3.8
Na_2SO_4	0·316	100	0.50	5.4
$NaClO_4$	0.316	82	1.00	10.9
Na.Acet	0.316	100	0.50	5.5
NaSCN	0.316	125	0.35	3.8

Table S-7

Cyclic voltammetry of Zn(II) in Tricine medium [4×10^{-4} M Zn(II) in 0.2 M $NaClO_4$]

pH = 8.00 $(E_f)_s = 1.000$ volts
Temp = 35 ± 0.1°C

Conc. of Tricine $\times 10^2$ in *M*	Conc. of Tricinate ion $[\bar{X}] \times 10^2$	Potential values in volts vs SCE		
		E_{pc}	E_{pa}	E_f
0.2	0.10	1.155	1.075	1.115
0.5	0.25	1.185	1.065	1.125
1.0	0.50	1.200	1.080	1.140
2.0	1.00	1.245	1.080	1.162
4.0	2.00	1.285	1.070	1.177
8.0	4.00	1.295	1.075	1.185
12.0	6.00	1.320	1.070	1.195
16.0	8.00	1.335	1.070	1.202
20.0	10.00	1.340	1.080	1.210

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

Table S-8

Cyclic voltammetry of Zn(II) in Bicine medium [4×10^{-4} M Zn(II) in 0.2 M $NaClO_4$]

pH =5.00
Temp. =35±0.1°C

$(E_p)_s$=1.000 volt

Conc. of Bicine $\times 10^2$ in *M*	Conc. of Bicinate ion $[\bar{X}]\times 10^6$	Potential values in volts vs SCE		
		E_{pc}	E_{pa}	E_p
0.5	3.8	1.070	1.015	1.042
1.0	7.7	1.110	1.000	1.055
2.0	15.5	1.125	1.005	1.065
4.0	30.9	1.150	1.005	1.077
8.0	61.8	1.155	1.020	1.087
12.0	92.8	1.165	1.020	1.092
16.0	123.7	1.170	1.030	1.100

Table S-9

Cyclic voltammetry of Eu(III) in different supporting electrolytes

Scan Rate 40 mv/sec Concentration of Eu(III) 4×10^{-4} *M*

Supporting electrolytes 0.1 *M*	E_{pc} volts	E_{pa} volts	$\triangle E$ mv	I_{pc} μA	I_{pa} μA	I_{pa}/I_{pc}
$NaNO_3$	−0.755	−0.480	275	0.76	0.50	0.657
Na_2SO_4	−0.770	−0.645	125	0.81	0.68	0.839
NaCl	−0.710	−0.560	150	0.91	0.66	0.725
$NaClO_4$	−0.710	−0.450	260	1.02	0.70	0.686
Na.acet	−0.790	−0.710	80	0.71	0.68	0.957
NaOCN	−0.715	−0.640	75	0.85	0.84	0.988

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

Table S-10

Calculated Values of haterogeneous rate constants (Ks) of Eu(III) in different supporting electrolytes at scan rate 40 mv/sec

Supporting electrolytes 0.1 *M*	$V^{\frac{1}{2}}$ volts/sec	$\Delta E_p x n$ mv	Ψ	$Ks \times 10^3$ cm/sec
$NaNO_3$	0.2	275	0.10	0.7
Na_2SO_4	0.2	125	0.35	2.4
NaCl	0.2	150	0.25	1.7
$NaClO_4$	0.2	260	0.10	0.7
Na.Acet	0.2	80	1.00	6.9
NaOCN	0.2	75	2.00	13.0

Table S-11

Cyclic voltammetry of Eu(III) in presence of EDTA

Scan Rate 40 mv/sec Supporting electrolyte 1.0 *M* NaCl

Conc. of EDTA $\times 10^3$ in *M*	E_{pc} volts	E_{pa} volts	E_p volts	ΔE mv	I_{pc} μA	I_{pa} μA	I_{pa}/I_{pc}
0.0	−0.765	0.450	−0.607	315	4.80	3.25	0.677
0.8	−0.765	−0.545	−0.655	220	3.70	3.10	0.837
2.0	−0.760	−0.595	−0.677	165	3.70	3.10	0.837
4.0	−0.780	−0.610	−0.695	170	3.12	2.52	0.808
8.0	−0.810	−0.665	−0.737	145	3.37	2.65	0.785
16.0	−0.890	−0.735	−0.812	155	3.20	2.35	0.734
32.0	−0.965	−0.825	−0.895	140	3.05	2.22	0.729
64.0	−1.060	−0.930	−0.995	130	3.17	2.57	0.811
100.0	−1.180	−1.050	−1.110	130	2.90	2.87	0.911

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

Table S-12

Cyclic voltammetry of Fe(III) at different concentrations of iron in 1.0 M $HClO_4$ soln. Scan Rate 40 mv/sec

Conc. of Fe(III) × 10^4 in *M*	E_{pc} volts	E_{pa} volts	ΔE mv	I_{pc} μA	I_{pa} μA	I_{pa}/I_{pc}	$Ks \times 10^3$ cm/sec
2.0	0.400	0.515	115	1.65	1.00	0.606	2.4
4.0	0.400	0.500	100	5.20	3.60	0.692	3.4
7.0	0.380	0.480	110	7.50	5.25	0.700	3.5
10.0	0.400	0.520	120	10.50	7.50	0.714	2.4
20.0	0.390	0.515	125	19.50	13.50	0.692	2.4
30.0	0.380	0.520	140	27.00	18.50	0.685	1.7

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

MECHANISTIC STUDIES OF N-HALOGENO REAGENTS

VINITA SHARMA

Abstract of the thesis accepted by the University of Jodhpur
For award of Ph.D. in Chemistry in the year 1985*

N-Bromoacetamide (NBA) and N-Bromosuccinimide (NBS) are perhaps the most important positive bromine containing organic compounds. The positive bromine compounds excel as halogenating agents, where it is desired to substitute bromine for an active hydrogen without adding bromine to an unsaturated linkage[1]. In addition to being used successfully as halogenating agents, several positive halogen compounds have been found to be effective agents for oxidation and dehydrogenation. The kinetic studies, involving N-haloamides deal mostly with the oxidation of alcohols[2, 3]. There seems to be no report of a systematic study of the oxidation of aliphatic aldehydes by any N-haloamide. Therefore, we have undertaken a mechanistic investigation of the oxidation of alkanals by NBA in both acid and alkaline solutions.

The thesis is divided into four chapters. The present day knowledge about the mechanism of the oxidations by N-halomides are reviewed in the first chapter. The experimental and computational techniques, used in this investigation are described in chapter two. The results and mechanistic conclusions of the oxidation of a series of seven alkanals by NBA in acid and alkali solutions are described in third and fourth chapters respectively.

OXIDATION OF ALKANALS BY NBA IN ACID MEDIUM

The oxidation of aromatic aldehydes by NBS[4,5] in acid solution has been reported by two groups of workers and they have suggested different mechanisms. Further, there is no report on the investigation of aliphatic aldehydes by any N-haloamide. The chief objectives of this study were to determine the role of

*This research work was done under the supervision of Dr. K.K. Banerji, Associate Professor of Chemistry, University of Jodhpur, Jodhpur.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

aldehyde hydrate in the oxidation process and to elucidate the mechanism of the reaction.

All the alkanals were commercial products. NBA was prepared by the reported method[3]. The reactions were carried out under pseudo-first-order conditions by keeping an excess of the alkanal over NBA and were followed iodometrically.

The oxidation results in the formation of corresponding carboxylic acid. The acids were estimated by ferric hydroximate method, after conversion to their methyl esters. The estimation shows that the yield of acetic acid in the oxidation of ethanal is nearly 90%. The oxidation failed to induce polymerisation of acrylonitrile in an atmosphere of nitrogen. The rate law for the oxidation is as follows :

$$-d[NBA]/dt = k_{ex}[NBA]\,[Aldehyde]\,[H^+] \qquad (1)$$

The oxidation of acet[^{2}H] aldehyde indicated the absence of a primary kinetic isotope effect. The value of solvent isotope effect, $k(H_2O)/k(D_2O)$, is 2.07 in the oxidation of ethanal. The rate increases with an increase in the proportion of acetic acid in binary solvent mixture of acetic acid and water. Addition of acetamide reduces the rate.

Retardation of rate by the addition of acetamide and the linear dependence of the rate on acidity are reminiscent of the results observed in the oxidation of alcohols[3,6] and suggest that the reactive oxidising species is hypobromous acidium ion $(H_2OBr)^+$.

$$MeCONHBr + H_2O \underset{}{\overset{K_h}{\rightleftharpoons}} MeCONH_2 + HOBr \qquad (2)$$

$$HOBr + H_3O^+ \rightleftharpoons (H_2OBr)^+ + H_2O \qquad (3)$$

From the values of experimental rate constant k_{ex}, and aldehyde hydrate dissociation constant, K_d[7], pertaining to reaction (4), the separate rate constants for the oxidation of aldehyde hydrate, and free aldehydes were computed. The values of k_{Hy} were obtained assuming that only the hydrated form will appear in the rate law (5).

$$RCH(OH)_2 \overset{K_d}{\rightleftharpoons} RCHO + H_2O \qquad (4)$$

$$Rate = k_{Hy}[NBA]\,[RCH(OH)_2]\,[H^+] \qquad (5)$$

Similarly, the values of k_A were calculated using the concentration of free aldehyde, according to rate law (6).

$$Rate = k_A[NBA]\,[RCHO]\,[H^+] \qquad (6)$$

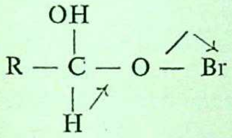
CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

The rates of oxidation of aldehyde hydrates, k_{Hy}, correlate very well with Taft's σ^* substituent constants with negative reaction constants. On the other hand, no such correlation exists between log k_A and σ^*. The existence of a good structure reactivity correlation in the oxidation of aldehyde hydrate confirms that the hydrate form is involve in the oxidation process.

The absence of a primary kinetic isotope effect shows that the aldehydic C-H bond is not cleaved in the rate-determining step. The observation of an inverse solvent isotope effect indicates that the hydroxyl group is involved either the rate-determining step or in a reaction prior to it. The following mechanism is therefore, proposed for the oxidation.

$$RCH(OH)_2 + (H_2OBr)^+ \xrightarrow{\text{slow}} RCH(OH)\,OBr + H_3O^+ \qquad (7)$$



$$\xrightarrow{\text{fast}} RCOOH + H^+ + Br^- \qquad (8)$$

OXIDATION OF ALKANALS BY NBA IN ALKALINE MEDIUM

It is known that the mechanism of several redox systems depends on the pH of the medium, e.g., reactions of permaganate ions[8] and chloramine-T[9]. Therefore, we have undertaken the kinetic investigation of the oxidation of alkanals by NBA in alkaline medium also, with a view to determine the role of hydrate form in the oxidation process and to elucidate the reaction mechanism.

The main product of the oxidation of alkanals is the corresponding carboxylic acid. The carboxylic acid was estimated as its methyl easter and the yield was 83%. The oxidation failed to induce polymerisation of acrylonitrile. At constant concentration of alkali, the rate of law for the oxidation is as follows :

$$-d\,[NBA]/dt = k_{ex}\,[RCHO]\,[NBA] \qquad (9)$$

The rate of oxidation decreases with an increase in the hydroxide ion concentration at constant ionic strength. The oxidation of acet [^{2}H] aldehyde indicated the absence of a primary kinetic isotope effect. The rate is reduced by the addition of acetamide. For the purpose of comparison, the oxidation of some of the aldehydes by sodium hypobromite was also studied. The kinetics of the oxidation by sodium hypobromine are parallel to those obtained in the oxidation by NBA.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

The retardation of rate by the addition of acetamide suggests a pre-equilibrium in which acetamide is a product.

$$MeCONHBr + H_2O \rightleftharpoons MeCONH_2 + HOBr \qquad (10)$$

Even at the lowest concentration of alkali used, hypobromous acid exists exclusively as hypobromite ion.

$$HOBr + OH^- \longrightarrow OBr^- + H_2O \qquad (11)$$

Thus, the most likely oxidising species is OBr^-. This postulation is supported by the existence of a linear free energy relationship between log [Rate] of the oxidation by NBA and hypobromite ion (r = 0.9899, slope = 1.03).

Separate rate constants were computed for the oxidation of aldehyde hydrates and free aldehyde by the procedure describe in earlier section. It is observed that the rate of oxidation of free aldehyde form of methanal, 2-chloroethanal and chloral are very high, almost approaching the limit of diffusion controlled reactions, whereas the rates of oxidation of hydrate forms are comparable to those of other organic compounds by NBA[10]. Thus, it seems that in alkaline solution also, the oxidation involves hydrate form of the alkanals.

The rate constants for the oxidation of aldehyde hydrates were obtained at different temperatures and activation parameters were calculated.

The retarding influence of hydroxide ion suggest an equilibrium in which hydroxide ion is a product. We propose that the rate determining step is the reversible nucleophilic attack of hypobromite ion on the aldehyde hydrate molecule, resulting in the formation of a hypobromite ester, which decomposes rapidly to carboxylic acid.

$$RCH(OH)_2 + OBr^- \underset{}{\overset{slow}{\rightleftharpoons}} RCH(OH)OBr + OH^- \qquad (12)$$

$$R-\underset{H}{\overset{OH}{C}}-O-Br \xrightarrow{fast} RCOOH + H^+ + Br^- \qquad (13)$$

A rate-determining bimolecular nucleophilic substitution is supported by the effect of structure on the reactivity of the alkanal. As in other bimolecular nucleophilic substitutions, branching at α- or β-carbon decreases the rate of reaction[11] and the introduction of electron withdrawing group increases the rate sharply[12].

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

REFERENCES

1. WOHL, A. (1919), *Ber.*, **52**, p. 51.
2. GOPALAKRISHNAN, G., PAI, B.R. and VENKATASUBRAMANIAN, N. (1980), *Indian J. Chem.*, **193**, p. 293.
3. MUKHERJEE, J. and BANERJI, K.K. (1981), *J. Org. Chem.*, **46**, p. 2323.
4. KANDILKAA, S., SETHURAM, B. and RAO, T.N. (1979), *Indian J. Chem.*, 17A, p. 264.
5. RADHAKRISHNAMURTI, P.S. and B. SAHU (1979), *Indian J. Chem.*, **17A**, p. 63.
6. NEGI, S.C., BHATIA, I. and BANERJI, K.K. (1981), *J. Chem. Res. (S)*, p. 360.
7. BELL, R.P. (1966), *Adv. Phys. Org. Chem.*, **4**, p. 1.
8. STEWART, R. (1965), In: "Oxidation in Organic Chemistry", Part A, (ed.) WIBERG, K.B., Academic Press, New York, p. 2.
9. NATARAJAN, M.M. and THIAGARAJAN, V. (1975), *J. Chem. Soc. Perkin Trans. 2*, p. 1590 and refs. cited therein.
10. SHAH, B. and BANERJI, K.K. (1983), *J. Chem. Soc. Perkin Trans.* .2 p. 33.
11. STREITWIESER, A. (1962), "Solvolytic Displacement Reactions", McGraw Hill, New York, p. 13.
12. HOLTZ, H.D. and STOCK, L.N. (1965), *J. Amer. Chem. Soc.*, **87**, p. 2404.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

STUDIES ON ISOTHIOURONIUM SALTS

G. L. SHARMA

Abstract of the thesis accepted by the University of Jodhpur
For award of Ph.D. in Chemistry in the year 1985*

In the present investigations, the reaction of phenols (viz. mono, di and trihydric phenols) with thioureas in the presence of halogen (bromine/iodine) has been studied.

Thioureas on reaction with halogen (bromine/iodine) have been shown to yield formamidine disulphide dihydrohalides. These compounds have been shown to undergo decomposition by halogens to the transient sulphenyl halides. These on electrophilic attack on the pyrrole, indole system give isothiouronium salt. Pyrroles being analogous to phenols in their chemical properties, it was thought worthwhile to investigate the reaction of phenols with thioureas in the presence of halogen (bromine/iodine) which yielded the S-(hydroxy substituted aryl)-isothiouronium salts. The presence of phenolic -OH group ortho to isothiouronium group imparts an additional property for the cyclisation of isothiouronium salt to 1, 3-benzoxathiol-2-ones.

The entire investigation has been described in four chapters.

CHAPTER I

This chapter deals with the reaction of monohydric phenols (viz. phenol, α-, β-naphthol, o-, m- and p-cresol) with theourea and N, N′-ethylene thiourea in the presence of halogen (bromine/iodine).

β-naphthol reacted with thiourea in the presence of halogen (bromine/iodine) at room temperature. In this reaction apart from the formation of S-(2-hydroxy-1-naphthyl) isothiouronium bromide, bis-(2-hydroxy-1-naphthyl) sulphide (2-napthol-1-sulphide) is also formed simultaneously in good yields. Structures of these products were ascertained through elemental analysis, IR, NMR and mass spectral data. A suitable mechanism for

---

*This research work was done under the supervision of Dr. J.P. Saxena, Professor of Chemistry, University of Jodhpur, Jodhpur.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

the formation of these two compounds has been described and discussed.

Further, the position of linkage of sulphur atom of thiourea has been decided by the cyclisation of S-(2-hydroxy-1-naphthyl) isothiouronium bromide into naphtho [1, 2-d] 1, 3-oxathiol-2-ones.

2-naphthol-1-sulphide is converted into dehydro-2-naphthol-1-sulphide by oxidation with alkaline potassium ferricyanide which indicates the position of attachment of sulphur atom at number one carbon atom of the two β-naphthol moiety. The work was extended to a similar study with 1, 6-dibromo-2-naphthol.

1, 6-dibromo-2-naphthol was also reacted with thiourea in methanol at room temperature. A large amount of sulphur separated initially. From the reaction mixture S-(6-bromo-2-hydroxy-1-naphthyl) isothiouronium bromide apart from bis-(6-bromo-2-hydroxy-1-naphthyl) sulphide were isolated. It was ascertained through the NMR data that it is the number one carbon of 1, 6-dibromo-2-naphthol which is involved in coupling with the sulphur atom of thiourea, after debromination.

β-naphthol reacted with N, N′-ethylene thiourea in the presence of bromine and gave the isothiouronium salt [1-(2-Imidazolin-2-ylthio)-2-naphthol hydrobromide]. The structures of these compounds have been ascertained through elemental analysis, IR and PMR spectra. In the case of α-naphthol, a sulphur containing compound which does not melt upto 350°C having phenolic group was obtained.

Reaction with o-, m- and p-cresol

In the case of m-cresol alone the product analysed correctly for S-(hydroxy-4-methylphenyl) isothiouronium bromide/iodine. Its structure was ascertained by converting it into 6-methyl-1, 3-benzoxathiol-2-one.

In the case of p-cresol, the product was isolated as a picrate of S-(2-hydroxy-5-methylphenyl) isothiouronium bromide. It may be seen that no side chain bromination takes place in this reaction.

No such isothiouronium salt could be isolated with o-cresol and phenol, although the reaction mixture responds to the test of a thiol (treatment with dilute solution of sodium hydroxide gave offensive smell of thiol and violet red colour with a drop of sodium nitroprusside).

Further when an equimolar amount of monohydric phenol; and

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

thiourea in the presence of iodine in methanol was boiled under reflux for 5-6 hours on a water bath. S-methyl isothiouronium iodide was isolated. Only in the case of β-naphthol apart from S-methyl isothiouronium iodide, a small amount of bis-(2-hydroxy-1-naphthyl) sulphide was also isolated.

When the above reaction was carried out with 6 ml of bromine in methanol and was boiled under reflux for 5-6 hours on a water bath, gummy masses were isolated which could not be crystallised.

CHAPTER II

This chapter deals with the reaction of dihydric phenols viz. hydroquinone, catechol, resorcinol and 2-methyl resorcinol with thiourea, N-phenyl thiourea and N, N′-ethylene thiourea in the presence of halogen (bromine/iodine). The products obtained were S-(dihydroxyphenyl)-isothiouronium salts.

Thus in the case of hydroquinone S-(2, 5-dihydroxy-phenyl) isothiouronium bromide/iodide was obtained as the final product of this reaction. In case of catechol it may be seen that the sulphur atom of thiourea can couple either at position 3 or 4 of the aromatic ring of catechol. A study of the NMR and IR spectrum of the product formed shows that it is the carbon at position 4 which is involved in this coupling reaction giving S-(3, 4-dihydroxyphenyl)-isothiouronium bromide/iodide. The linkage at this position –4–is further confirmed by the fact that this compound does not yield any cyclised product of the type 5/6-hydroxy-1,3-benzoxathiol-2-one, for which the hydroxy group has to be ortho to the isothiouronium group i.e. at position 3.

In the case of resorcinol it may be seen that the sulphur atom of thiourea has the option to couple either at position 2, 4 or 5 of the aromatic ring of resorcinol. A study of NMR and IR spectrum of the product obtained reveals that it is the position 4 which is involved in this coupling reaction to yield S-(2, 4-dihydroxyphenyl) isothiouronium bromide/iodide. This has been further confirmed by its cyclisation to give 6-hydroxy-1, 3-benzoxathiol-2-one.

In the case of reaction with 2-methyl resorcinol it may be seen that the sulphur atom of theourea can couple either at position 4 or 5 of the aromatic ring of 2-methyl resorcinol. A study of the NMR and IR spectrum of the product formed reveals that it is again position 4 of 2-methyl resorcinol which is involved in this coupling reaction S-(2, 4-dihydroxy-3-methylphenyl) isothiouro-

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

nium bromide/iodide. This compound was cyclised into 6-hydroxy-7-methyl-1, 3-benzoxathiol-2-one, which further supports the position of attachment of sulphur of thiourea to 2-methyl resorcinol. It may be seen that no side chain bromination has taken place in this reaction.

The work was extended to a similar study with the substituted thiourea viz. N-phenyl thiourea and N, N′-ethylene thiourea, N-phenyl thiourea alone gave satisfactory product with resorcinol and other substances gave only intractable mixture which could not be worked up. The sulphur atom of N-phenyl thiocarbamide also coupled at the same position 4 of resorcinol as confirmed by the NMR spectrum of S-(2, 4-dihydroxy phenyl)-N-phenyl isothiouronium bromide/iodide.

S-(2, 4-dihydroxyphenyl) isothiouronium bromide was treated with conc. H_2SO_4 in order to bring about cyclisation of the isothiouronium salt to the expected 2-amino-5-hydroxy benzothiazole but it only resulted into the formation of its sulphate i.e. S-(2, 4-dihydroxyphenyl) isothiouronium sulphate.

S-(dihydroxyphenyl) isothiouronium bromides were also synthesised by an alternative method i.e. by the reaction of dihydric phenol with freshly prepared solid formamidine disulphide dihydrobromide.

Further, when the reaction was carried out at high temperature on a water bath, in different alcohols (viz. methanol, etfianol, 1-propanol, 2-propanol, 1-butanol and cyclohexanol) as solvent. When the reaction mixture was boiled under reflux on a water bath for 5-6 hours, not only the yield of the product decreased but altogether different compounds were obtained, out of which one of them was prominently S-alkyl isothiouronium salt (the alkyl part coming from the alcohol used). The formation of the S-alkyl isothiouronium salt was ascertained by preparing their 2:4-dinitro benzene derivative, elemental analysis and NMR spectra. A suitable mechanism for the formation of S-alkyl isothiouronium salt has been suggested.

CHAPTER III

This chapter deals with the reaction of trihydric phenols viz. phloroglucinol and pyrogallol with thiourea in the presence of halogen (bromine/iodine) has been described. The product obtained were S-(trihydroxyphenyl) isothiouronium salts.

In the case of pyrogallol it may be seen that the sulphur atom of thiourea can couple either at position 4 or 5 of the aromatic

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

ring of pyrogallol. A study of the NMR and IR spectrum of the product formed shows that it is position 4 which is involved in this coupling reaction giving S-(2, 3, 4-trihydroxyphenyl) isothiouronium bromide/iodide. The linkage at this position 4 is further confirmed by the fact that this compound got cyclised into 6, 7-dihydroxy-1, 3-benzoxathiol-2-one.

In the case of phloroglucinol S-(2, 4, 6-trihydroxy phenyl) isothiouronium bromide/iodide were readily obtained by this reaction. This compound in turn was cyclised into the 4, 6-dihydroxy 1, 3-benzoxathiol-2-one. The structures of these products were ascertained through elemental analysis, IR and PMR spectral data.

The work was extended to a similar study with N, N′-ethylene thiourea but no reaction took place under identical conditions. This may probably be due to steric effect.

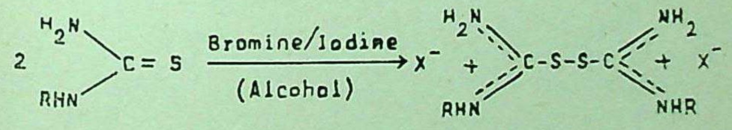
The S-(hydroxy substituted phenyl) isothiouronium salt prepared in chapters 1, 2 and 3 was converted into their respective bis-(hydroxy-aryl) disulphides through their thiols by the action of 10% sodium hydroxide and iodine (KI-I_2).

Reaction Mechanism

The following steps are suggested for the mechanism of formation of S-(hydroy substituted phenyl) isothiouronium salt.

(1) *Oxidation of thioureas by halogen (bromide/iodine)*

Thiourea and its N-aryl derivatives have been known to get oxidised with halogens into formamidine disulphide dihydrohalide (I).



(R = H or aryl) (I)

(X = Br or I)

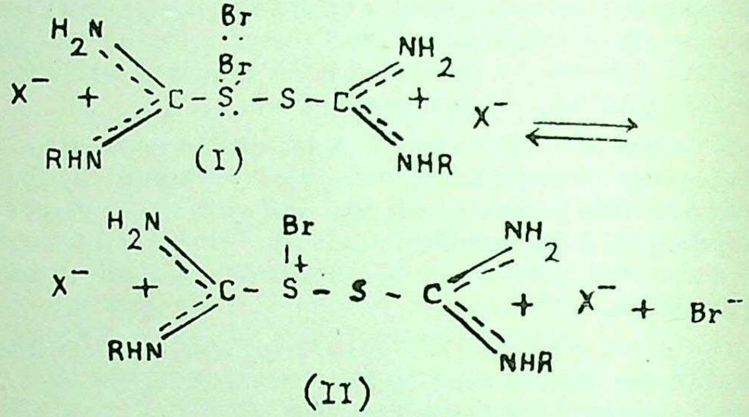
(2) *The cleavage of formamidine disulphide dihydrohalide (I) By excess of halogen*

The initial step in the cleavage seems to be an equilibrium addition of bromine to the sulphur atom of formamidine di-

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

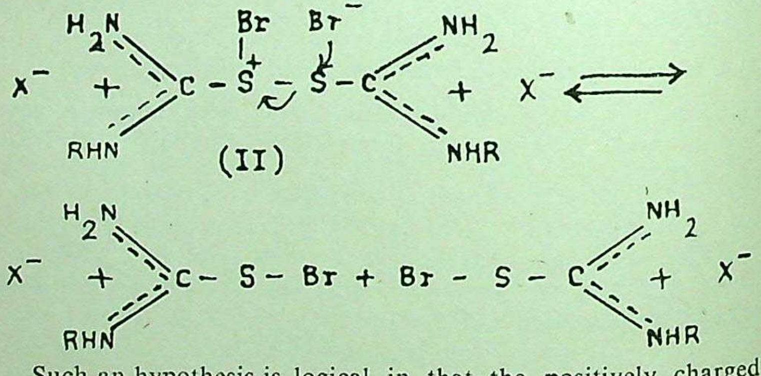
Digitized by Arya Samaj Foundation Chennai and eGangotri

sulphide dihydro halide (I) to form a bromosulphonium bromide (II).



This postulate is logical in view of the known addition of bromine to organic disulphides, and is supported by experimental facts.

Now in the second step symmetrical cleavage of disulphide bond takes place by the nucleophilic attack of the bromide ion on the second carbon atom, when the disulphide bond is irreversibly cleaved, presumably to the transient reactive sulphenyl bromide (III).



Such an hypothesis is logical in that the positively charged sulphur atom of the bromo sulphonium bromide (II) would attract the binding electronics of the disulphide bond. The resulting electron deficiency at the second sulphur atom would render it susceptible to the nucleophilic attack by the bromide ion.

(3) *Electrophilic attack of sulphenyi cation on phenol*

The sulphenyl cation through an electrophilic attack on phenol

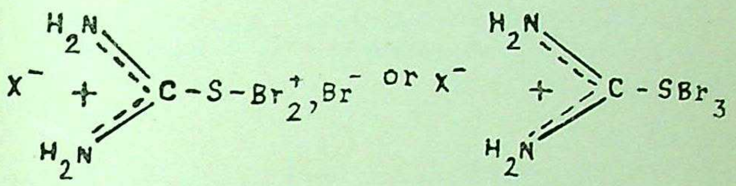
CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

resulted into the formation of S-(hydroxy substituted phenyl) isothiousonium salt as shown below.

Study of the effect of increase of the concentration of bromine in above reaction :

Apparently the bromine concentration and the phenol, used in the reaction determines the ultimate fate of the cleaved product. Possibly the sulphenyl bromide undergoes addition in the presence of excess of bromine giving a fragment such as :



While a deficiency of bromine permits conversion of the sulphenyl bromide to the disulphide.

Whatever be the actual structure of the intermediate sulphur fragment, its liable nature seems to promote an equilibrium between products and the intermediates of the cleavage reaction. With low bromine concentrations sulphur containing solids (which could not be crystallised) or syrupy or gummy masses were obtained, while higher bromine concentrations led to sulphur free solids or a syrupy mass.

Best yields of the isothiouronium salts are obtained when the reaction is carried out by using a slight excess of bromine (slightly more than one mole).

CHAPTER IV

This chapter deals with the reaction of p-benzoquinone with S-(dihydroxyphenyl) isothiouronium salt in methanol. In each case the products obtained were 2-amino-6-hydroxybenzothiazole. The identity of the product was established through Co.tlc and mixed m.p. with the authentic sample. The structure of the products was ascertained through elemental analysis, IR and NMR spectral data.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

ANALYTICAL STUDIES ON POLLUTANTS AND TOXIC SUBSTANCES IN INDUSTRIAL WASTE WATERS

SHYAM LAL KALANI

Abstract of the thesis accepted by the University of Jodhpur
For award of Ph.D. in Chemistry in the year 1985*

Numerous industries in India presently discharge untreated waste water on land or in natural streams causing pollution of surface water, ground water and soil. The textile processing industries are one of the major sources of the polluted water and the disposal of dye waate water poses a major problem for these industries. The textile processing industries discharge untreated waste water which contains a number of contaminants such as acid or alkali, dissolved solids, toxic compounds and unused dyes. Numerous such industries have been established in the Jodhpur region of western Rajasthan. Presently more than 1200 textile processing units have been established in this region which consume 30 million litres of water resulting in a discharge of 15 million litres of untreated waste water daily, which spreads over a large area of land. Since the sandy soil of this region is highly porous, it permits large scale percolation of water. The waste water, thus discharged, has been posing a serious threat to the ground water reserves of this region.

Most of the textile processing units in Jodhpur have been established in Basni and Shastrinagar industrial complexes. These industries consume nearly 8 million litres of water for various processes, resulting in a discharge of about 4 million litres of waste water daily. The waste waters of these industries flow in open drains.

Textile waste waters of the two industrial complexes of Jodhpur, have been analysed and some toxic organic compounds, namely, phenols and aromatic amines have been detected and

---

*This research work was done under the supervision of Dr. R. C. Kapoor, Professor & Head of the Chemistry Department, University of Jodhpur.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

estimated. Attempt has been made to reduce the colour and organic constituents of the waste water by treating it with some synthesised guar derivatives. Some important physico-chemical parameters of the synthesised guar derivatives have also been determined. The adsorption behaviour of a number of commonly used dyes on these derivatives has also been investigated.

DETECTION AND ESTIMATION OF ORGANIC COMPOUNDS

The sampling of textile effluents was done by standard procedures from two points of the open drains of Basni and Shastrinagar industrial complexes. The extraction of phenols and aromatic amines was done by solvent extraction at pH 2 and 11 using methylene chloride as the solvent. The extraction efficiency of methylene chloride at pH 2 and 11 was evaluated, employing solutions of respective phenols and aromatic amines of known concentrations. The extraction efficiencies for these compounds were found to be more than 70%. The following compounds were detected in the waste water and their estimations were carried out by reverse phase high pressure liquid chromatography (HPLC).

Phenols : Phenol, o-nitrophenol, p-nitrophenol, o-chlorophenol, m-chlorophenol, p-chlorophenol, α-naphthol, β-naphthol, *Aromatic amines* : Benzidine, p-nitroaniline, o-toluidine, p-toluidine and α-naphthylamine.

Column used : RP–18 (4.6 mm × 25 cm, 10μm particle size)

Detector : LC 6 UV absorbance detector (254 nm wave length).

The elution was done with 55:45 (by volume) methanol : triple distilled degassed water mixture at the rate of 1 ml/min. at room temperature.

The identification of the compounds was made by matching their retention times with those of the known standard samples run under identical experimental conditions. This was further confirmed by noting the increase in peak heights by standard sample addition method. The amounts of these compounds, present in the textile effluents, were determined from the calibration curves for each compound. The amounts of different phenols were found to vary from 460 to 8300 μg/l and that of the amines from 231 to 2174 μg/l.

Considerable variation in the concentration of phenols and aromatic amines was observed. The amount of these compounds present in the textile waste mainly depends on the number of

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

textile processing industries working at a time; the amount of water discharged by these industries, the nature and purity of the chemicals used in these industries.

Phenol, chlorophenols and naphthols are toxic and poisonous in nature, whereas o- and p-nitrophenols are irritant to skin and produce kidney and liver injury. Benzidine, α-naphthylamine and o-toluidine are suspected carcinogens, whereas p-toluidine and p-nitroaniles are severe poisons and toxic in nature. The presence of these compounds in waste water therefore poses a hazard to personnel as well as to the purity of the ground water resources of Jodhpur.

SYNTHESIS OF GUAR GUM DERIVATIVES

Guar gum, a water soluble naturally occurring polysaccharide was made insoluble by cross linking with epichlorohydrine in alkaline medium under nitrogen atmosphere at 40°C. Cationic guar derivatives were synthesised by reaction with cross-linked guar and trimethyl/triethyl 2-epoxypropyl ammonium chloride in inert solvent e.g. toluene at 50-60°C. Anionic guar derivatives were synthesised by reaction with cross-linked guar and 2-epoxypropyl sulphonic acid at room temperature in inert medium and also by grafting with acrylic acid in presence of ferrous ion and hydrogen peroxide at room temperature in aqueous medium.

DETERMINATION OF PHYSICAL PROPERTIES AND ADSORPTION BEHAVIOUR

The physical properties of these derivatives, such as swelling, water regain, stability at different pH, particle size and ion exchange capacities, were carefully studied. These values have been summarized in Table A.

The adsorption of direct, reactive and hydrolysed reactive dyes (normally present in the local textile effluents) was studied on the cationic guar derivatives and their Freundlich adsorption isotherms were obtained, The influence of pH, initial dye concentration, nature of adsorbent, and contact time on the adsorption was investigated. It was observed that the adsorption capacity for direct, reactive and hydrolysed reactive dyes on cationic guar derivative increased with decrease in pH and for lower initial dye concentration. The adsorption of dyes occurred significantly on trimethyl quaternary aminised guar derivative and adsorption equilibrium was reached within 50 minutes.

The adsorption of basic dyes, such as methylene blue etc. from its aqueous solution, was observed on anionic guar deriva-

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

tives and Freundlich adsorption isotherms were obtained. The adsorption capacity for the dye on the anionic guar derivatives was more at higher pH and for lower initial dye concentration. The acrylic acid-grafted guar derivative was found to be a more suitable adsorbent than the sulphonic acid guar derivative. The adsorption equilibrium was reached in about 60 minutes.

TREATMENT OF TEXTILE WASTE WATERS

Characteristics of textile waste water such as suspended solid (SS), total dissolved solids (TDS), pH, intensity of colour (OD) and total oxidizable organics (chemical oxygen demand) were determined from time to time.

For the removal of colour and soluble organic constituents, the textile effluents were separately treated with different amounts of aluminium sulphate and various synthesised guar derivatives at different pH conditions. Thus, the optimum amounts of aluminium sulphate and suitable guar derivative and favourable pH were found for improving the quality of textile waste water. It was observed that at pH 5, 750 mg/l aluminium sulphate reduced the OD by 55% and the COD by 48% from the textile effluent. It was also abserved that the cross-linked guar derivative reduced the OD and COD of the effluent in lower pH range only, while the trimethyl quaternary aminised guar was found effective in the whole of the studied pH (3-11) range. The efficiency of this derivative increased as the pH was decreased. It was observed that the OD and COD values of the effluent were reduced by 77% and 69% respectively when a litre of effluent was treated with 1 g of trimethyl quaternary aminised guar derivative at pH 5 for 1 hour. Thus trimethyl quaternary aminised guar derivative appeared to be more suitable for treating the textile waste water.

Textile waste water was also treated by column method with trimethyl quaternary aminised guar derivative at pH 5. It was observed that large volumes of textile waste water can be treated with only a few grams of the synthesised guar derivatives.

The textile effluent samples were treated with variable amounts of aluminium sulphate in conjunction with a fixed amount of guar derivative and vice versa at pH 5. It was observed that 500 mg/l of trimethyl quaternary aminised guar in conjunction with 750 mg/l of aluminium sulphate was a suitable quantity which reduced 85% of OD and 78% of COD of the textile effluent. Thus the influence of guar derivative on the efficiency of aluminium sulphate and vice versa were evaluated.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

It is concluded that the quality of the textile effluent, as regards to colour, odour and toxic contaminants, can be improved considerably by first lowering its pH and then subjecting to sedimentation, coagulation and adsorption. The waste water, thus treated, possesses much lower objectionable parameters and can be recycled for industrial use. However it is not presently possible to speculate whether it can be suitably treated to produce potable water.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

Table A

Physical properties of the synthesised guar gum derivatives

S. No.	Guar gum derivatives	Swelling in water	Water regain (g/g) or (ml/g)		Stability	Particle size (mesh)	Exchange capacities		
			Suction filteration method	Blotting paper method			Salt splitting capacity (meq/g)	Weak acid capacity (meq/g)	Total exchange capacity (meq/g)
1.	Cross linked	Slightly swelling takes place	2.51	2.68	Stable in the pH (3—10) range about 6 weeks	80% 40-60 20% > 60	—	0.23 ±0.03	—
2.	Triethyl quaternary aminised	,,	2.31	2.45	,,	50% 40-60 50% > 60	0.28 ±0.08	0.18 ±0.07	—
3.	Trimethyl quaternary aminised	,,	2.27	2.38	,,	60% 40-80 40% > 80	0.62 0.03	0.25 ±0.05	—
4.	Sulphonic acid	,,	2.43	2.58	,,	60% 60-80 40% > 80	—	—	0.30 ±0.07
5.	Acrylic acid grafted	,,	2.37	2.51	,,	40% 60-80 60% > 80	—	—	0.98 ±0.05

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

FLUORESCENCE AND ABSORPTION STUDIES OF SOME ORGANIC MOLECULES

SEEMA ACHARYA

Abstract of the thesis accepted by the University of Jodhpur
For award of Ph.D. in Chemistry in the year 1985 *

The thesis incorporates the investigations of the influence of various classes of surfactants on the fluorescence and absorption behaviour of fluorescent polynuclear compounds and some dyes They are :

1. 1, 3-Dihydroxy naphthalene
2. 2, 3-Dihydroxy naphthalene
3. Ethyl Eosin
4. Auramine-O
5. Safranine-O
6. Fuchsin acid

The surfactants employed for the studies are of three categories, viz., nonionic, anionic and cationic. The fluorescence studies have been made with the help of Perkin Elmer Fluorescence Spectrophotometer Model No. 204 A. For absorption studies UV VIS Specord has been used. The solubilizing action of the surfactants has been confirmed by the light scattering studies made with light scattering spectrophotometer model No. 2000.

The results of the influence of various surfactants on each fluorescent dye and polynuclear compound are summarised as follows :

DYES

ETHYL EOSIN

The emission and absorption spectra of the dye at various concentrations indicate that cationic and nonionic surfactants have almost similar influence. Anionic surfactants do not seem to have any significant effect.

---

*This research work was done under the supervision of Dr. R.C. Kapoor, Prof. & Head, Department of Chemistry, University of Jodhpur, Jodhpur.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

A. Nonionic Surfactants

Nonionic surfactants appear to exert maximum influence on the fluorescence characteristics of ethyl eosin. A red shift of 20 nm in λ_{max} accompanied by enhancement in the fluorescence intensity is observed at the minimum concentration of Tween-40, Tween-60 and Tween-80 while the intensity reduces initially on the addition of TX-100 and Brij-35. The enhanced fluorescence intensity attains a limiting value in each case.

The absorption intensity also gets initially reduced and a red shift occurs at this decreased absorbance. The red shift in the absorption and fluorescence peaks indicates that some interaction takes place between the dye and the surfactant micelle. The hydrophilic part of the surfactant would interact preferentially with the dye multimeric forms. Dye monomeric-dimeric equilibrium appears to establish inside the nonionic surfactant micelles at their low concentration. However, at higher concentration a complete disaggregation of the dye molecules occurs. This appears to be the reason for initial decrease and subsequent increase on the addition of TX-100 and Brij-35.

B. Anionic Surfactants

Anionic surfactants exert no influence on the absorption and fluorescence spectra of the dye since the surfactant as well as the dye are anionic in nature; any significant interaction is ruled out due to mutual repulsion.

C. Cationic Surfactants

The fluorescence intensity initially drops almost to zero level at a particular concentration of each cationic surfactant, accompanied by a red shift in the λ_{max}. Subsequently, the fluorescence intensity increases on further addition of surfactant and exceeds its original fluorescence intensity. A preferential interaction of the anionic dye with the cationic surfactants would normally be expected. Thus, initially the interaction causes a change in the molecular geometry of the dye resulting in inactivation of the fluorescing sites. A simultaneous red shift in the λ_{max} confirms the inactivation hypothesis. The dye molecule in its changed conformation appears to be easily susceptible to disaggregation on further addition of the surfactant. Thus, it explains the enhancement of fluorescence intensity on subsequent addition of the surfactant.

Basically, attractive forces appear to be predominent in the interaction between nonionic/cationic surfactant and the dye in solution. This is apparent from the occurrence of red shift in

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

the absorption and fluorescence spectra of ethyl eosin on the addition of cationic and nonionic surfactants. With cationic surfactants, the opposite charges between the surfactant and anionic dye results in a strong attractive forces, while with the nonionic surfactants the attraction may result from induced dipole effects.

AURAMINE O

The anionic surfactants appear to exert maximum influence on fluorescence and absorption spectra of the dye. The effects of various surfactants have been explained on the hypothesis of dye-surfactant interaction and disaggregation process. Cationic surfactants did not seem to have any noticeable influence on the optical behaviour of the dye.

A. Nonionic Surfactants

The influence of nonionic surfactants on the fluorescence intensity is considerable. Initially, a gradual but small increase occurs, while at higher concentrations a large enhancement takes place. Addition of TX-100 and Tween-40 results in the maximum influence. A red shift in λ_{max} is observed with each surfactant.

An initial decrease in the absorbance occurs which further increases at higher concentration of the surfactant. Enhancement in fluorescence intensity appears to be due to disaggregation of dye molecules. Initial decrease in the absorbance can be explained on the basis that the interaction of the surfactant takes place before the formation of micelle. Increase in the absorbance at higher concentrations of the surfactant indicates disaggregation of the dye molecule.

B. Anionic Surfactants

During the initial addition of the surfactant an increase in the fluorescence intensity is observed followed by a sudden decrease which reaches a minimum value. Further increase in surfactant concentration causes enhancement in fluorescence intensity. A gradual red shift is concurrently observed. Anionic surfactants exert the maximum influence on the absorption characteristics. On the initial addition of the surfactant a decrease in the absorbance is noticed. On increasing the surfactant concentration, the intensity starts increasing accompanied by a red shift.

The initial decrease in the absorbance can be explained on the basis that electrostatic attraction occurs between anionic part of the surfactant and cationic part of the dye forming an ion pair. The dye molecule in its changed conformation appears

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

to be easily susceptible to disaggregation. This explains the observed enhancement in fluorescence intensity on subsequent addition of the surfactant.

C. Cationic Surfactants

Cationic surfactants have minimum influence on the fluorescence spectrum of auramine-o. All the four of these influence the absorbance of the dye in different manner. On adding CPB an enhancement in the absorbance of the dye solution occurs. A very slight enhancement in the fluorescence intensity is observed with all the cationic surfactants.

A disaggregation process takes place due to the formation of surfactant micelle which results in an enhancement of its fluorescence intensity. Due to its cationic character, the surfactant interacts with the anionic part of the dye which is not the colour forming component. This may explain the minimal influence on the absorption spectrum by the cationic surfactants.

FUCHSIN ACID

Fuchsin acid possesses both cationic and anionic nature; however, anionic nature is predominent. The influence of various nonionic, anionic and cationic surfactants on the fluorescence and absorption spectra of the dye is described below :

A. Nonionic Surfactants

On adding nonionic surfactants a gradual but a very small enhancement occurs in the emission intensity which reaches a limiting value. No shift in the emission peak wavelength is noticeable. All the four surfactants behave similarly while Brij-35 behaves differently. Initial addition of Brij-35 to the dye solution cause a decrease in the intensity which reaches a limiting value. On further addition of Brij-35 the fluorescence intensity gradually gets increased and become constant at a very high concentrations of the surfactant.

The absorption intensity decreases slightly on the addition of nonionic surfactants. On increasing the concentration absorbance increases continuously with no shift in the peak wavelength.

B. Anionic Surfactants

Of all the four anionic surfactants employed for the study, DBSS exerts the maximum inflence. The fluorescence intensity increases immediately reaching upto five times the original intensity. A

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

blue shift of 5 nm occurs when the intensity reaches thrice its original value.

Initially, the absorbance becomes zero but on subsequent addition of the surfactants it increases reaching a constant value. A small shift towards longer wavelength is noticed.

C. Cationic Surfactants

All the cationic surfactants behave differently. CPC and CPB cause a sharp decrease in intensity to a minimum value and the dye solution gets decolourised. It seems that at this concentration of the surfactant the dye becomes nonfluorescent. On the other hand CTAB shows maximum influence. On its addition, the intensity increases gradually reaching a limiting value, accompanied by a blue shift. CDBAC behaves similarly but the influence is to a less extent.

The absorption intensity falls down to zero on adding cationic surfactants. The fall in intensity is immediate with CPC or CPB but gradual with CTAB or CDBAC and a red shift, occurs. This difference in their behaviour seems to be due to the difference in their molecular structures.

SAFRANINE—O

It is a strongly fluorescent dye which gives fluorescence emission peak at 375 nm and absorption peak at 521 nm. The dye being cationic in nature is influenced to the maximum extent by the anionic surfactants.

A. Nonionic Surfactants

Addition of nonionic surfactants cause a gradual but a very small increase in the fluorescence intensity. A blue shift of 10 nm is also observed which indicates the presence of some repulsive forces. The enhancement in intensity may be due to disaggregation process.

B. Anionic Surfactants

Initial addition of the surfactant causes a decrease in the fluorescence intensity which reaches zero. At higher concentration of the surfactant, the intensity starts increasing gradually, accompanied by a blue shift of 10 nm. Aerosol-OT, at its higher concentration does not cause any increase in the intensity. Here it appears that interaction process takes place between the cationic dye species and the anionic surfactants.

Addition of the surfactant of dye solution, initially caused decrease in absorbance without any shift in the peak wavelength.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

At higher concentration of the surfactant, the absorbance increases and over reaches the original value accompanied by a red shift.

C. Cationic Surfactants

The cationic surfactants do not show any influence on the fluorescence as well as absorption intensity. Both the dye and the surfactant are cationic in nature hence seem to repel each other.

1.3—DIHYDROXY NAPHTHALENE

The solubilization of 1,3-dihydroxy naphthalene (DHN) molecules by surfactants has been studied by observing its fluorescence behaviour. The solubilizing action has been confirmed by light scattering measurements, by observing the decrease in the scattering flux when the concentration of the surfactant is increased.

A. Nonionic Surfactants

Enhancement in the fluorescence intensity takes place during initial addition and the peak height reaches a limiting value at higher concentrations of the surfactant. This increase in intensity is four times more than its original value at the limiting surfactant concentration. Here, solubilization of the suspended particles of 1,3-DHN seems to take place. This presumption is also supported by light scattering studies. Maximum galvanometer deflection is caused by the nonionic surfactants.

B. Anionic Surfactants

The fluorescence intensity first decreases on adding the surfactant, reaching a minimum value at a specific concentration of each surfactant. The shape as well as the λ_{max} of the spectrum remain unchanged on adding anionic surfactant. A decrease in the scattering flux occurs on the addition of surfactant. The decrease in fluorescence intensity may be attributed to the preferential interaction between 1,3-DHN and the surfactant particles.

C. Cationic Surfactants

Addition of cationic surfactants also causes a decrease in the emission intensity as well as scattering flux. All the surfactants behave in a similar way excepting that at higher concentrations of CTAB only a slight increase in the peak intensity is observed. A preferential interaction between the hydroxyl ion of 1,3-DHN and cationic part of the surfactant may be assumed.

However, the preferential interaction does not cause any basic

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

structural change in 1,3-DHN molecule, as no change occurs in the shape of fluorescence excitation and emission spectra of the compound on the addition of these surfactants.

2.3—Dihydroxy Naphthalene

The behaviour of 2,3-DHN is almost similar to that of 1,3—DHN, as they are both isomer of each other. The influence of various surfactants on 2, 3-DHN is as follows :

A. Nonionic Surfactants

A continuous enhancement in the fluorescence intensity occurs on the addition of the surfactant. The order of enhancement with surfactants being Tween-60 > Trition X-100 > Tween-80 > Tween-40 > Brij-35. A gradual blue shift of 8 nm in λ_{max} is observed with each nonionic surfactant.

B. Anionic Surfactants

During initial addition of the surfactants a slight increase in the fluorescence intensity occurs which shows a large decrease on further increasing the surfactant concentration. At higher concentrations of the surfactant again a slight increase in the intensity is observed accompanied by a blue shift in the λ_{max}. A decrease in the scattering flux also occurs.

C. Cationic Surfactants

A continuous decrease in the fluorescence intensity occurs on adding any of the cationic surfactant till a minimum is reached. The peak wavelength shows a blue shift and the shape of the spectrum also shows a little modification. Scattering flux also shows a decrease on the addition of the surfactant.

The slight difference in the behaviour of 2,3-DHN and 1,3-DHN appears to be due to the difference in the positions of the two hydroxy-groups in the molecule. Both the hydroxy groups are adjacent to each other in 2,3-DHN molecule. It appears that they may offer steric hindrance to the interaction between the surfactants and the one of the hydroxy group of the molecule itself. In case of 1,3-DHN the two hydroxy groups are at 1 and 3 position, hence they are sufficiently apart to prevent steric hindrance.

The decrease in galvanometer deflection observed during the light scattering measurements indicates that the ionic surfactants also solubilize the molecules of 1,3-DHN and 2,3-DHN.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

STUDIES ON REAGENTS FOR PEPTIDE SYNTHESIS

(MISS) INDU DOSHI

Abstract of the thesis accepted by the University of Jodhpur
For award of Ph.D. in Chemistry in the year 1985*

Peptide synthesis has been indeed the field of great interest and significance in present biochemical world. A protein synthesising chemist is always in the search of new selective and convenient acylating and coupling reagents. The current investigation relates to the study of some reactions leading to peptide synthesis and preparation of certain derivatives of peptides and amino acids.

Oxidation of cyclic imides was tried by peracetic acid and lead tetraacetate. A partial success was achieved. The hydrogen abstraction from the imidic nitrogen was difficult due to its low nucleophilic reactivity. Head of high temperature was disqualified by homelytic fission of peroxide bond. With lead tetraacetate corresponding acetoxy derivatives were formed, which were difficult to hydrolyse to give their corresponding N-hydroxy derivatives.

Tosyl, mesyl, formyl groups are among well known acylating groups. But their parent compounds are pungent, irritating and corrosive chemicals. N-Tosyl, N-mesyl and N-formy saccharins were prepared to transacylate the amines and the amino acids. These compounds are free from odour, corrosive nature. Parallel to N-N-thionyldiimidazole, N-N'-thionyldisaccharin was prepared by the condensation of saccharin and thionyl chloride and was employed for synthesis of N-acyl saccharins derived from aliphatic, alicyclic and aromatic acids.

Looking at the selective removal of chlorines from 6-trichloro-triazene, the reagent was employed for the coupling of amino group moiety with the carboxy group moiety. Similar to many other reagents, it has been found to be an effective reagent for the production of acid chlorides of carboxylic acids.

N-Substituted amino acids were also prepared using saccharin as amination reagent.

*This research work was done under the supervision of Dr. N.K. Mathur, Professor of Chemistry, University of Jodhpur, Jodhpur.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

ANALYSIS OF TRACE BIO-ORGANICS BY ELECTROANALYTICAL TECHNIQUES

(MRS.) SUNITA KUMBHAT

Abstract of the thesis accepted by the University of Jodhpur
For award of Ph.D. in Chemistry in the year 1985*

The present studies were undertaken to obtain a better understanding of some organic redox reaction occurring at the mercury electrode. Organic compounds having carbonyl group were selected for the study. Formaldehyde and acetaldehyde were selected for studying reduction and ascorbic acid was chosen for oxidation reactions. The DC and DPP techniques were employed to study these reactions.

All polarographic experiments were carried out using a 174-A Polarographic Analyzer (Princeton Applied Research, USA) and a Houston X-Y recorder. A three electrode-assembly with dropping mercury electrode as the working electrode, a platinum wire as auxiliary electrode and a saturated calomel electrode as reference electrode was used. The DPP experiments were carried out with the following experimental conditions—pulse amplitude 50 mv (formaldehyde and acetaldehyde), 25 mv (ascorbic acid); Scan rate 5 mv/sec (formaldehyde and acetaldehyde), 2 mv/sec (ascorbic acid) and drop time 1 sec for all the experiments.

POLAROGRAPHIC BEHAVIOUR OF FORMALDEHYDE

Reduction of formaldehyde is one of the earliest processes designated as kinetic in classical polarography. Behaviour of formaldehyde reduction was investigated by DPP at a fixed pH ranging from 7 to 13 employing phosphate buffer and lithium chloride as the supporting electrolyte.

A shift of peak towards more negative potential and enhancement of peak height was observed with increasing pH. The peak potential (E_p) and peak current (I_p) values are given in Table 1.

---

*This research work was done undert he supervision of Prof. R.C. Kapoor, Head of the Chemistry Department, University of Jodhpur, Jodhpur.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

Table 1

Variation of peak potential and peak current of formaldehyde with pH

Conc. 5×10^{-4} *M* — Pulse amplitude 50 mv
Phosphate buffer — Scan rate 5 mv/sec
Temp. 27° C — Drop time 1 sec

pH	E_p (volts vs SCE)	I_p (μA)
7.1	−1.41	0.98
8.0	−1.44	1.28
9.2	−1.46	1.40
10.2	−1.51	2.77
11.0	−1.56	7.30
12.0	−1.62	24.30
13.0	−1.72	45.90

Influence of concentration on the DPP behaviour of formaldehyde was also observed in different pH media. At low alkalinity a slight shift of E_p towards positive potential was observed while at higher pH, E_p remained unaffected by change in concentration. However increase in peak current with concentration was observed in all the cases.

Measurement of peak half width and comparison with theoretical values at a fixed pulse amplitude confirms the generally accepted reduction mechanism of formaldehyde involving 2-electron.

POLAROGRAPHIC BEHAVIOUR OF ACETALDEHYDE

Polarographic behaviour of acetaldehyde in aqueous media was investigated at different pH, using dc and DPP polarography. In alkaline media (pH 8 to 13) a small pre-wave was observed in addition to the main wave. However at pH 5, 6.2 and 7.0 only a small wave was discerned in the pre-wave region while the main wave merged with hydrogen evolution. The limiting current of the pre-wave was not influenced by pH while that of the main wave increased with pH. Variation in limiting current with mercury pressure was also observed at different pH.

To get a better understanding about the nature of pre-wave and also about the overall reduction mechanism DPP studies were undertaken.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

The Table 2 shows peak potential and peak current values at different pH for a 5×10^{-3} M solution of acetaldehyde.

Table 2

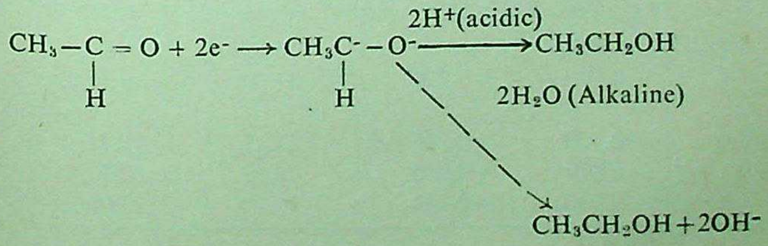
Differential pulse polarographic characteristics of acetaldehyde at different pH

Conc. 5×10^{-3} M; Phosphate buffer; Pulse amplitude 50 mv
Supp. electrolyte 0.2 M LiCl, Scan rate 5 mv/sec
Temp. 27° C Drop time 1 sec

pH	Peak potential (volt)		Peak current (μA)	
	I peak	II peak	I peak	II peak
7.0	−1.440	−1.83	2.60	72.50
8.0	−1.445	−1.74	2.52	52.85
9.2	−1.450	−1.84	2.61	44.85
10.2	−1.490	−1.82	2.70	39.67
11.0	−1.520	−1.83	2.44	44.25
12.0	−1.530	−1.87	2.12	78.55
13.0	−1.530	−1.90	2.99	126.50

The effect of varying the concentration on DP polarographic behaviour was also observed at all the pH media. Increase in peak current was observed with increasing concentration. However peak separation increases with the rise in concentration as peak potential of first peak shifted towards more positive potential while that of second peak shifted towards more negative potential.

Since pre-waves are usually associated with adsorption phenomenon at electrode surface, it appears probable that acetaldehyde is reduced by consuming 2-electron resulting in breaking of C=O bond and formation of a carbanion.



CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

The intermediate carbanion remains adsorbed at the electrode before being protonated or hydrated into ethanol. This explains the presence of adsorption wave at all the pH values studied.

POLAROGRAPHIC BEHAVIOUR OF ASCORBIC ACID

Study of dc current-voltage curves were made at pH 3.2, 5.05, 7.1, 8.0, 9.1 and 11.2 employing Britton-Robinson buffers. There occurred a profound change in the characteristics of the anodic wave on changing the pH of the media. Double wave started appearing in the alkaline medium. With increase in pH the wave shifted towards more negative potentials. A 5 unit change in pH causes a change of 390 mv in the first wave. The wave height also changed with the change in pH. The influence of change of concentration and height of mercury column was observed at different pH media.

The log-plot analysis of dc waves showed a one straight line at pH 3.2, 5.0 and 7.1 whereas 2-straight lines were obtained at pH 8.0, 9.1 and 11.2.

The detailed DPP studies made in different pH media have yielded various characteristics which are summarized in Table 3.

Table 3

Variation in peak potential and peak current of Ascorbic acid at different pH

Conc. 5×10^{-4} *M* — Pulse amplitude 25 mv
B.R. Buffer — Scan rate 2 mv/sec
Temp. 27° C — Drop time 1 sec

pH	Peak potential (volt)		Peak current (μA)	
	I peak	II peak	I peak	II peak
3.2	+0.175	—	30.00	—
5.0	+0.050	—	15.00	—
7.1	−0.010	+0.220	31.00	14.75 (just a spike)
8.0	−0.050	+0.130	27.25	11.75
9.1	−0.070	+0.075	24.50	10.75
11.2	−0.230	−0.140	19.20	12.00

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

Concentration relationship of peak potential and peak height were investigated at all the pH media. On increasing the concentration a shift towards more positive potential (showing oxidation) was observed at all the pH. In case of peak potential of the first peak, maximum shift of 50 mv was observed at pH 5.0, while for second peak maximum shift of 85 mv was observed at pH 9.1. I_p vs concentration plots for first peak generally followed a straight line, however for second peak these plots did not follow a linear path.

The number of electrons involved in the electrode process was evaluated by DPP. A plot of peak half width ($W_{1/2}$) and pulse amplitude ($\triangle E$) for 1.04×10^{-4} *M* ascorbic acid at pH 5.1 was made. The comparison of experimental $W_{1/2}$ vs $\triangle E$ plot with that of theoretical one, at different 'n' values, showed a reversible oxidation involving 2-electrons. Peak half width values calculated from DP polarograms are given in Table 4.

Table 4

Effect of pulse amplitude on peak half width

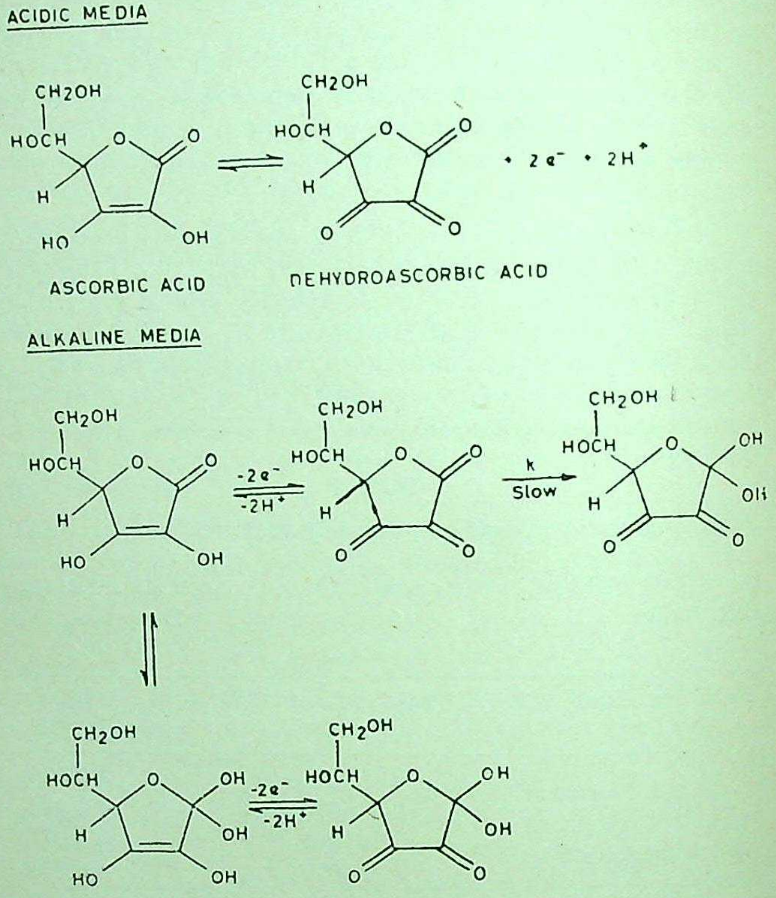
Conc. 1.04×10^{-4} *M* ascorbic acid — Scan Rate 2 mv/sec
B.R. Buffer — Drop time 1 sec
Temp. 27° C

Pulse amplitude, $\triangle E$ (mv)	Peak half width, $W_{1/2}$ (mv)	E_p (volt)
5	071	+0.085
10	070	+0.080
25	065	+0.075
50	075	+0.060
100	110	+0.050

It is apparent from the splitting of wave in the alkaline media that the oxidation process involves two-steps in alkaline solution. The probable mechanism in both the media is as follows :

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri



CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

CHEMICAL STUDIES OF MEDICINAL PLANTS OF RAJASTHAN DESERT
WITH SPECIAL REFERENCE TO *CITRULLUS COLOCYNTHIS*

(MISS) UPMA GUPTA

Abstract of the thesis accepted by the University of Jodhpur
For award of Ph.D. in Chemistry in the year 1985*

Among the large number of medicinal plants growing in the western Rajasthan, *Citrullus Colocynthis* was selected for the present study because of its immense medicinal uses in cancer, stomach disorders, jaundice, urin disorders, bacterial infections etc. The plant *C. colocynthis* is a prostate annual herb and belongs to cucurbitaceae family. The plant grown in Sahara and Californian deserts have been investigated for its anticanceric properties. However, no such studies have been done on the species of this plant found in Thar desert of Rajasthan (India).

In the present study the fruit coat and fruit pulp of *C. colocynthis* were separately extracted successively with benzene, ethyl acetate, and ethanol. The benzene extract of the fruit coat was chromatographed on silicagel successively with petrolium ether, petrolium ether-benzene mixtures (95 : 5, 90 : 10, 85 : 15, 70 : 30), and benzene. From column fractions 93-163 (85 : 15 petrolium ether-benzene mixture), n-hentriacontane (C-1) was isolated and characterised on the basis of its chemical reactions and spectral studies (IR, NMR and Mass spectrum).

From the ethyl acetate extract of fruit coat one pure compound '2-0-acetyl-3—methyl-6-nonyl-5-0-β-D - glactosyl-1, 4-benzoquinone' (C-2) was isolated and characterised on the basis of its chemical reactions and the studies of IR, UV, NMR and Mass spectra. It was found to be a quinone glycoside. On acid hydrolysis it gave precipitate from which two aglycones were separated with the help of PLC and crystallization and were

*This research work was done under the supervision of Dr. S.P. Garg, Associate Professor of Chemistry, University of Jodhpur, Jodhpur.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

identified as '5-0-acetyl-2-hydroxy-3-methyl-6-n-nonyl-1, 4-benzoquinone', and '2,5-dihydrozy-3-methyl-6-n-nonyl-1, 4-benzoquinone' respectively on the basis of chemical and spectral studies. From the filtrate D-galactose was identified with the help of paper chromatogaphy, m.p., and m.m.p. with authentic sample.

The benzene extract of the fruit pulp was chromatographed on silica-gel successively with petrolium ether and petrolium ether-benzene mixtures (90 : 10, 80 : 20, 70 : 30). From column fractions 171-220 (80 : 20, petrolium ether-benzene mixture) n-hentriacontane (C-1) was isolated and characterised on the basis of its chemical reactions and IR, NMR and Mass spectral studies.

The ethyl acetate extract of pulp was chromatographed on silica gel with benzene and benzene-methanol mixtures (90 : 10, 80 : 20, 70 : 30, 60 : 40, 50 : 50). From column fractions 51-115 (90 : 10, benzene-methanol mixture) compound having molecular formula $C_{30} H_{40} O_6$ (C-3) was isolated. It could not be characterised because of its low yield. From column fractions 116-410 (90 : 10, 80 : 20, benzene-methanol mixture), elateridine (C-4) and Hexa-nor-cucurbitacin-I (C-5) were isolated and characterised on the basis of their chemical and spectral (UV, IR, NMR and Mass) characteristics. Column fractions 501-589 (70 : 30 benzene methanol mixture) gave '16-0-acetyl-hexa-nor-cucurbitacin-I' (C-7) which was identified on the basis of its chemical reactions and spectral studies. From column fractions 590-605 (60 : 40, benzene-methanol mixture), '2-0-β-D-glucopyranosyl-hexa-nor-cucurbitacin-I' (C-B) was isolated and characterised by chemical and spectral studies (UV, IR, NMR and Mass spectra). The compound C-8 on acid hydrolysis gave a water insoluble aglycone which was characterised as 'hexa-nor-cucurbitacin-I' on the basis of its chemical reactions and spectral studies. From the filtrate D-glucose was isolated and identified. From column fractions 606-667 (50 : 50, benzene : methanol mixture), '2-O-β-D-16-0-β-D-di-glucopyranosyl-hexa-nor-cucurbitacin-I' (C-9) was isolated and characterised on the basis of chemical reactions and spectral studies (UV, IR, NMR and Mass spectra). It also gave 'Hexa-nor-cucurbitacin-I' and 'D-glucose' on acid hydrolysis. D-glucose was estimated to be two molecules per molecule of the glucoside.

The ethanolic extract of fruit pulp was chromatographed on silica gel successively with benzene-methanol mixture (80 : 20,

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

70 : 30, 60 : 40, 50 : 50) and pure methanol. From column fractions 86-201 (70 : 30, 60 : 40, benzene-methanol mixtures) '2-0-β-D-16-0-β-D-diglucosyl cucurbitacin-E' (C-10) was isolated and characterised on the basis of its chemical reactions and spectral studies.

It was interesting to note that the six compounds, C-2, C-5, C-7, C-8, C-9 and C-10 isolated above have not so far been reported from any synthetic or natural source.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

PHYSICO-CHEMICAL STUDIES OF CERTAIN METAL CHELATES WITH NEW LIGANDS AND THEIR ANALYTICAL APPLICATIONS

JAGADAMBA, J.Y.

Abstract of the thesis accepted by the University of Jodhpur
For award of Ph.D. in Chemistry in the year 1985*

The observation in the present investigation are summarised as given below. Two different types of chelates have been synthesised. The first one, is N-2-Hydnoxy-1-Naphthalidene-Glycine and the second is Girard-P-Resaceto-Phenone. The formulae of the two Ligands are as shown below.

1. N-2-hydroxy-Naphthalidene- Glycine
11. Girard-P-Resacetophenone

These reagents are basically different in their structures. One of them contains a solubilising group due to Girard-P. The second one has been prepared from Hydroxy-1-Naphthaldehyde and has a lower solubility. This is a biprotic, tridentate ligand containing a corboxylic, phenolic hydroxyl and anmino group.

GPRP is monoprotic, bidentate ligand with a strongly co-ordinating azomethine group. In both the reagents nitrogen atom is the strong donor.

With the first ligand the Potentiometric studies of the complexes of Cobalt, Nickel, Copper, Zinc, Cadmium and Uranium were carried. The step wise dissociation constants and the formation constants were carried in 40% water-diexane midium at a constant ionic strength. The solid complexes of various metal ions were prepared and their composition has been established by the determination of molecular weight, percentage of water and nitrogen. The magnetic succeptibility of these metal

*This research work was done under the supervision of Dr. S.P. Rao, Associate Professor of Chemistry, University of Jodhpur, Jodhpur.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

complexes have been studied by Gouy method. This procedure was used for the hydrated metal complexes as well as their Pyridine solvates. This helps in finding the number of unpaired electrons and hence the possible hybridization in the metal complexes. On this basis it was possible to assign the structures of the various solid metal complexes. These were discussed. The results are in agreement with these reported in the literature.

In case of Girard-P derivative of Resacetophenone the metal ion formed 1 : 2 complexes is Cu, UO2, Ni, Zn, Co. In case of lanthanide metals they form 1 : 3 complexes and their order of stability is Sm, Nd, Pr. This order is in agreement with lanthanide contraction. In case of this ligand the metal complexes have been studied by potentiometric as well as spectrophotometric methods. The results obtained by both these metals are in agreements and the nature of bonding has been discussed. In general the results are in agreements with these reported in the literature.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

STRUCTURE AND FUNCTIONS OF VENTRAL SCENT MARKING GLAND OF THE INDIAN GERBIL, *TATERA INDICA INDICA* HARDWICKE AND THE ROLE OF ODOURS IN BEHAVIOURAL COMMUNICATION

MOHD. IDRIS

Abstract of thesis accepted by the University of Jodhpur
For award of Ph.D. in Zoology in the year 1985*

Mammals utilise a number of exudative organs and processes for scent production and a universal use of chemical communication is suggested by the frequent appearance of scent glands and pheromone secretion in many species. Most commonly used organs for this purpose are the dermal sebaceous glands, distributed on different parts of the body. Very little work has been done on such aspects on Indian rodents. With a view to further advance the knowledge on this hitherto little known subject, work was started on the Indian gerbil, *Tatera indica indica* Hardwicke.

A large number of Indian gerbil, *Tatera indica* inhabit a single burrow in the village complex or around an urban area but they live individually or in pairs in dry scrub grasslands. These two distinct populations of *Tatera indica* exhibit a difference in the frequency of occurrence of the mid ventral scent marking gland. It occurs in 90.40% males (N = 344) and 42.29% females (N = 339) collected from dry scrub grassland but it occurred in 84.39% males (N = 205) and 3.89% females (N = 231) collected from the urban area (at Bikaner).

The glandular pad in male *T. indica* is dirty yellowish in colour, fairly covered with hair and elongate in shape. In females, it appears as a thin line. The occurrence of the ventral scent marking gland has been reported in both the sexes for the first time. It is significantly ($P < 0.001$) larger in males than that of female gerbils.

The area of the scent marking gland is positively and significantly ($P < 0.01$) correlated with body weight and body length of the animals.

---

*This research work was done under the supervision of Dr. Ishwar Prakash, Professor of Emeritus, Central Arid Zone Research Institute, Jodhpur.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

Histological studies revealed that the ventral scent marking gland is composed of complexes of enlarged sebaceous alveoli of holocrine type which are full of fatty material. The surface of the skin of the ventral scent marking gland area is papillated. Sebaceous gland alveoli are present only in the glandular structure and they are greatly enlarged in comparison to the skin of other parts. The gerbils mark low-lying objects in the environment by rubbing with its mid ventral sebaceous gland and deposit the sebum exudation on it which has a musky odour. During scent marking, *T. indica* lowers its ventrum by flexing the abdomen and by extending the fore-limbs, the ventrum is then dragged forward and pressed against the substratum.

The frequency of perineal rub (urine marking), scent marking and urination by the female Indian gerbil is enhanced ($P<0.05$, $P<0.01$) during pro-oestrus and oestrus as compared to those during dioestrus. However, in the adult females devoid of the gland, such significant difference was not observed. However, the frequency of perineal rub (urine marking) significantly ($P<0.05$) increased during pro-oestrus and oestrus as compared to that during dioestrus. The enhanced urine and scent marking during pro-oestrus and dioestrus by females of *T. indica* collected from scrub grassland indicates that oestrus females advertise their sexual receptivity through this manner of olfactory communication. In female lacking the scent marking gland collected from urban habitat, sexual receptivity is signalled by urine marking.

The social behaviour of the Indian gerbil, *Tatera indica* was studied in semi-natural condition of a large rattery Observations made at the time of their maximum activity during evenings for 30 days revealed that *T. indica* are "contact" and "pair tolerant" animals and that their social organisation is based on multi-dominance of both the sexes. The dominant females were found to be as aggressive as the dominant males. Frequency of scent marking and urine marking is broadly correlated with dominance hierarchy.

The odour of sebum marking gland persists at the most for two days it is also quite possible that the resident male *Tatera indica* superimposes its own sebum odour on that of the strange male and thus masking it. The original smell may persist.

The frequency of scent as well as urine marking of *T. indica* declined significantly ($P<0.05$) with increasing group size. When the male Indian gerbil had maximum area at its command, it marked on an average 9.33 times but when the rodent density was increased to 6 to 12 animals in the cage the frequency of scent marking reduced to 50 to 60 per cent of the individual marking

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

scores. Acts concerning agonistic behaviour gradually increased with increased group size. In the uni-sexual and bisexual groups only the dominant animals performed scent marking, urine marking and agonistic behaviour.

Observations on the frequency of scent marking in varying density situations also indicate that the need for olfactory cues is greater in sparsely populated *T indica* than in a high density situation where intraspecific communication may be carried out by direct contact visual and/or auditory means. Another explanation to this variation in scent marking rate could be that the Indian gerbils maintain an optimum distance in their home ranges by leaving olfactory cues for conspecific animals so as to minimise the competition for the scanty food resource in the desert grasslands.

Behavioural responses of the Indian gerbil, *Tatera indica* to conspecific sebum odour of the male and female ventral scent gland were studied in wooden pen and plus maze. All the three categories of *T. indica* (males possessing scent gland, females possessing the gland and female without gland) preferred the part of the pen carrying the odour of own sex. In cases when the sebum of opposite sex was offered against no sebum they preferred the former, suggesting that the sebum of the scent marking gland has a biochemical communication function in this genus. In plus maze the food consumption of both sexes increased significantly ($P<0.001$) in presence of sebum odour.

In T-maze, *T indica* females with gland preferred the arm carrying the odour of strange male and the females without scent gland equally preferred sebum odours of the strange male and female possessing the ventral scent marking gland.

Behavioural activities of male Indian gerbil increased significantly ($P<0.01$) when they were exposed to the urine of females especially those in oestrus. It indicates that the urine odours are definitive olfactory signals in *T. indica.*

The response of *T. ind ca* to interspecific sebum, urine odour and the influence on the scent marking activity of *T. indica* due to the presence of other rodent species was studied in semi-natural condition of a rattery. A significant ($P<0.05$) enhancement of the frequency of sebum marking by both male and female *M. hurrianae* was observed after release of *T indica.* The sebum marking by males as well as urine marking by both the sexes of *T. indica* also enhanced. The ranges of movements of both the sexes of *M. hurrianae* got reduced significantly ($P<0.05$) after release of *T. indica*

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

in the rattery suggesting that the size of gland and home range of an animal have no relationship.

It has also been experimentally revealed that the rodent odour does function as phago-stimulant. The intake of scented millet with conspecific sebum/urine is enhanced significantly ($P<0.01$). Addition of 0.5 per cent interspecific urine between food consumption by male as well as female *T. indica* decreased significantly ($P<0.001$) which indicates the female interspecific urine of *R. meltada pallidior* function as a sort of repellent to food consumption by *T. indica*. Bajra scented with body odours of *R. meltada pallidior* was offered to *T. indica* and that scented with *T. indica* was offered to *R. meltada pallidior*. The consumption of scented bajra with interspecific body odours increased significantly ($P<0.05$ and $P<0.01$). It has already been observed that the addition of sebum or its odour and urine to poisoned food masks the poison aversion and bait shyness in *T. indica*.

Investigations to study the association between hormones and scent marking behaviour in the Indian gerbil, *Tatera indica* revealed that castration reduces the frequency of scent as well as urine marking significantly within two weeks. The response of castrated animals to testosterone propionate therapy was gradual and the peak scent marking activity was attained after 8 weeks of administering the injection on a weekly interval. However, this hormone therapy could not enhance the scent marking activity to the level that of normal animals. The marking activity dropped no sooner the weekly injections were stopped. Such clear cut effect of hormonal therapy was, however, not observed on urine marking behaviour in *T. indica* which may indicate that control of this activity may be regulated by a number of hormones.

Results of this work have clearly shown that the odour of the sebum exuded by the mid-abdominal scent marking gland in the Indian gerbil, *Tatera indica indica* is a definitive chemical signal which serves to trigger a response in conspecific receiver. The results of the experiments have indicated that this biochemical cue is used by *T. indica* not only for territorial marking but also to delineate the 'home' to the sender of this releaser. This chemical signal also denotes the dominant status of an individual in a social group and ready-to-mate state of a female. The whole sebum, whole urine (more so of females in oestrus), and their odours bear phago-stimulant and poison shyness-masking properties—an hitherto unreported faculty of sebum and urine which if added to poison bait will increase the control success manifolds.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

A STUDY OF HYDROMAGNETIC BOUNDARY LAYER FLOW PROBLEMS

RAM NIWAS JAT

Abstract of the thesis accepted by the University of Jodhpur
For award of Ph.D. in Mathematics in the year 1985*

The work done by the author deals mainly with the study of two dimensional magnetohydrodynamic/magnetogasdynamic boundary layer flow problems in the presence of transverse/aligned magnetic fields. It includes the study of heat transfer in MHD-boundary layer flow past a flat plat in the presence of a uniform transverse magnetic field, similar solutions of the MGD-boundary layer flow for the two cases of applied magnetic field, viz., transverse and aligned to the fluid flow, non-similar solutions of compressible steady boundary layer for arbitrary Prandtl numbers when the magnetic field is transverse to the flow field and perturbation solution of the compressible boundary layer free jet.

In Chapter II, we have studied the effects of a uniform transverse magnetic field on the flow of a viscous incompressible electrically conducting fluid past a flat plate by the modified Falkner-Skan transformation (Bansal 1981) meant for non-magnetic flows. Expressions for the velocity field, coefficient of skin friction, coefficient of magnetic drag are obtained and the range of the magnetic interaction parameter, for which the results are physically acceptable, is determined. For the solution of the energy equation, we have first calculated the series solution of the cooling problem, neglecting dissipation term and Joule heating, and then the series solution of the adiabatic wall, with full equation, has been obtained. The two solutions are then properly superimposed. The numerical results for heat transfer rate and temperature recovery factor for arbitrary Prandtl number are obtained. Contrary to the conjecture of

*This research work was done under the supervision of Dr. J. L. Bansal, Professor of Mathematics, University of Jodhpur, Jodhpur.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

earlier authors, it is observed that the recovery factor for arbitrary Prandtl number is influenced by the presence of the magnetic field. In fact it decreases for Pr 1 >and increases for $Pr < 1$. It is only for $Pr = 1$, the recovery factor is independent of the magnetic field.

It is now well known that the 'similar' solutions play an important role within the class of exact solutions in the boundary layer theory. The search for 'similar' solutions in case of MFD boundary layer flows is still continuing. In Chapter III, 'similar' solutions of an electrically conducting compressible fluid in the presence of a variable transverse magnetic field for small magnetie Reynolds number and for arbitrary pressure gradients are studied. The governing equations, under certain restrictions, are integrated numerically and the numerical results for velocity as well as shearing stress are obtained.

When the magnetic Reynolds number is large then the diffusion of the magnetic field takes place in a narrow zone called the magnetic_boundary layer and is ordinarily of comparable magnitude with viscous and thermal boundary layers. In Chapter IV, conditions for the existence of 'similarity' solution for a two dimensional magnetogasdynamic boundary layer flow in the presence of an aligned magnetic field and for non-zero pressure gradient for velocity, thermal and magnetic boundary layers obtained.

In Chapter V the laminar boundary layer equations for a two-dimensional steady compressible electrically conducting fluid in the presence of a transverse magetic field are first transformed from the physical plane to the Illingworth-Stewartson plane of OFD and then a new transformation, which includes the effects of the magnetic field is applied. A series solution of the boundary layer equations has been developed for a class of 'non-similar' flows. The numerical solutions of the governing equations, taking Prandtl number of the fluid as unity, three cases of wall conditions viz., (i) cooled wall, (ii) adiabatic wall and (iii) heated wall and for three values of Mach number viz., 0, 1 and 2, against magnetic parameter are obtained. The numerical results are given for skin-friction and heat transfer rate.

Chapter VI is devoted to the study of a class of 'non-similar' solutions of velocity and temperature distributions in a laminar two-dimensional compressible electrically conducting fluid in the presence of a transverse magnetic field for arbitrary Prandtl number by the technique developed in Chapter V. The numerical

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

results for the velocity, skin-friction and heat transfer rate are obtained for the two cases of wall conditions viz., (i) cooled wall and (ii) heated wall and for three values of Mach number viz., 0, 1 and 2.

In Chapter VII, i.e. the last chapter, we have studied the effects of a uniform transverse magnetic field on the flow of a viscous compressible electrically conducting fluid in a free jet by perturbation on the Schlichting model. Experessions for the velocity field, enthalpy field and the mass flow rate are obtained and the range of the magnetic interaction parameter, for which the results are physically acceptable, is determined.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

Faculty of Commerce

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

REGIONAL RURAL BANKS IN INDIA (AN APPRAISAL WITH SPECIAL REFERENCE TO RAJASTHAN)

BAJRANG LAL VAISHNAW

Abstract of the thesis accepted by the University of Jodhpur
For award of Ph. D. in Commerce in the year 1985*

Sustained economic growth in India cannot be achieved without a vibrant agricultural and rural economy, hence our rural economy must receive adequate attention. The concept of Rural Banking gives a new thrust to the regeneration of India's rural economy. Among the various requirements for the development of rural economy, the availability of adequate and right type of credit at proper time is very important.

The credit requirements for the purpose of rural development are met by institutional as well as private non-institutional agencies. Inspite of the fact that notional coverage of co-operative agencies has been large and expansion of rural branches of commercial banks has also been pursued, the fact remained that at the end of June 1975, a large part of rural credit requirements was not covered by these agencies. Therefore, it was necessary to have some organisation which would contribute towards bridging the gap which existed in rural credit requirements.

Setting up of State-sponsored, regionally-based and rural-oriented banks called Regional Rural Banks was conceived to be the appropriate agency, which would combine the local feel and familiarity with several problems which the co-operatives possess and the degree of business organisation, ability to mobilise deposits, access to central money markets and a modernised outlook which the commercial banks have. The Government of India promulgated the Regional Rural Banks Ordinance on 26th September, 1975, and the first five Regional Rural Banks were established on 2nd October, 1975. The Ordinance was later on replaced by the Regional Rural Bank Act, 1976.

*This research work was done under the supervision of Professor V.N. Hukku, Head and Dean, Faculty of Commerce, University of Jodhpur, Jodhpur.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

Now since the first decade of the initiation of the Regional Rural Banks is over, it has been considered desirable to undertake this research study to assess their working with special reference to Rajasthan. The study is based on analysis of authentic data published by official agencies like the Government of India, Reserve Bank of India, National Bank for Agriculture and Rural Development, sponsoring banks and the Regional Rural Banks themselves. To supplement the Statistical Analysis it has also been considered desirable to analyse information collected by personal interviews with the senior officers of the Regional Rural Banks, the borrowers, the government officials and the representatives of workers Union. This has facilitated deep probe in making an appraisal of the role of Regional Rural Banks.

The study has been presented in Seven Chapters, along with two questionnaires, and twenty-two Appendix Tables.

The first two chapters have been devoted to an assessment of the existing rural credit arrangement prior to 1975. Based on the findings regarding the inadequacy of the institutional credit the need for creation of a new agency—Regional Rural Banks—has been justified to fill up the regional and functional gaps in rural credit.

The Chapter III is devoted to highlight the salient features of the Regional Rural Banks keeping in view the difference between the scheme recommended by the Banking Commission and the Working Group and the existing scheme implemented by the Government of India. While pointing out the satisfactory progress in certain aspects of growth the study highlights the bottlenecks thereto and other impediments in the smooth functioning of Regional Rural Banks. The details of financial resources of Regional Rural Banks in India have been discussed in Chapter IV. The highlights pointed out are :

(a) As per the provision of Regional Rural Banks Act, the paid-up share capital of each Regional Rural Bank is fixed at 25 lakh rupees. Though there is a provision in the Act permitting a change in the issued capital, yet the capital is by and large the same as laid down in the Act. In case of some Regional Rural Banks, in a few States, the paid-up capital has not even touched this prescribed level. Share Capital accounts for an insignificant share in the total resources of Regional Rural Banks. In order to get more cost free funds, the desirability of increasing the share capital of these banks has been examined along with the desirability of participation

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

by National Bank for Agriculture and Rural Development (NABARD) in the share holding of Regional Rural Banks.

(b) Though the amount of reserve fund has been continuously increasing in aggregate at all India level as well as in the States because of an increase in the number of Regional Rural Banks, operating in profit, yet its contribution to the total financial resources has been negligible.

(c) Deposit mobilisation by Regional Rural Banks does not only provide one of the important sources of funds but it is also an instrument for development of banking habits among rural people of weaker sections. Regional Rural Banks have recorded satisfactory performance in deposit mobilisation. The factors which contributed to this achievement have been discussed in this chapter. In the initial years annual growth rate of deposits had been higher because Regional Rural Banks being a new institution in rural area, exploited the whole potentiality; but thereafter the rate of increase has gradually declined.

Main hurdles inhibiting satisfactory progress in this field have also been discussed in this chapter and policy changes have been suggested to strengthen deposit mobilisation.

(d) Borrowings are the second important source of funds for Regional Rural Banks for which they resort to National Bank for Agriculture and Rural Development (formerly from Reserve Bank of India and Agricultural Refinance and Development Corporation), Industrial Development Bank of India and the respective sponsor banks. It has been noted that Regional Rural Banks which are operating for a period of 5 years or more have enjoyed refinance facilities significantly, but it is a point of concern that they have not utilised full available benefit of refinance from sponsor banks and Industrial Development Bank of India.

Chapter V is devoted to a detailed description of the Operations of Regional Rural Banks — with an eye on focussing two aspects viz. :

(a) Regional Rural Banks have focussed their attention of providing credit essentially to the weaker section of people.

(b) Their cost structure has been distinctly lower than that of commercial Banks. These were major policy considerations in setting up the Regional Rural Banks.

The performance of the Regional Rural Banks is inadequate in terms of its geographic coverage and the level of their advances. The Regional Rural Banks were set up only recently and most of

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

them are not even 5 year old. To expect that they would fill in the banking and credit gap in such a short period of time is perhaps unrealistic. The important fact is that they have moved in the right direction.

It has been established that though most of the Regional Rural Banks have not been able to meet the targets of disbursement of credit set by the Government of India and are still far away from the stage of achieving financial viability, yet they have established their potentiality as a 'Development Bank' of the rural poor. This is no mean an achievement in the short period of their existence so far.

The relative merit of these banks as compared to rural branches of commercial banks and cooperative societies has also been testified.

The actual working of the Regional Rural Banks in India reveals that they have in fact been working largely for the social objectives for which they were set up. They have generally faced tremendous odds in expanding their business in their infancy in a relatively inhospitable local environment due to lack of adequate support from the State government and existing cooperative institutions.

Chapter VI concentrates on the study of Management aspects of Regional Rural Banks in India. It is inferred that the general superintendence, direction and management of affairs and business of Regional Rural Banks rest with their Board of Directors, consisting of nominees of Government of India, State Governments and the Sponsor Banks. The role of various institutions in exercising supervisory or directional control over the policy formulation and decision making has been critically examined in this Chapter.

It is observed on the basis of interviews held with various officials of Regional Rural Banks, Sponsor Banks, National Bank for Agriculture and Rural Development, and the Reserve Bank of India that there is a general feeling amongst the Regional Rural Banks that they are being "Controlled" by so many agencies and hence the decisions on vital matters are often time consuming. In view of the increase in the number of Regional Rural Bank and the nature of the various problems faced by them, need is felt for a central agency to guide and assist in looking after all the issues related to them.

It is also inferred that the extent and quality of staff support provided by the sponsor banks is indequate, particularly in the initial stages. Officers deputed by the sponsor banks may not

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

always be the best available to hold the administrative positions in the Regional Rural Banks.

Critical assessment of the recruitment, training and promotion policy has been made in this chapter. In most of the states, the staff turnover of Regional Rural Banks is quite high. This exodus can hardly be controlled unless the banks develop an in-built system of promotions and revise their service conditions to provide adequate motivation for good and efficient work.

In the absence of any promotion policy for officers, the Regional Rural Banks have not been able to build up a suitable cadre of their own to attend to control functions at their administrative offices or look after bigger branches. Hence a definite policy of promotion needs to be formulated and implemented with immediate effect.

Of late, 'Unions' in Regional Rural Banks have raised demand for parity with commercial banks in salary and allowances and other monetary benefits. It will however, not be possible for the Regional Rural Banks to pay to their staff salary and allowances at par with commercial banks otherwise their viability would be jeopardised.

Chapter VII gives an exhaustive account of Regional Rural Banks operating in Rajasthan. In a rural and agricultural economy of Rajasthan, where cooperative and commercial banking structures have failed to fully cater to financial needs of rural society, the need for Regional Rural Banks is evident.

Rajasthan is among the first few states where a Regional Rural Bank was set up on 2nd October 1975 viz., Jaipur Nagaur, Aanchalik Gramin Bank at Jaipur. Thereafter eight more Regional Rural Banks have been setup by now. Nineteen districts are covered by these Regional Rural Banks.

The role of Regional Rural Banks of Rajasthan has been examined in respect of providing banking services in remote, rural and unbanked centres through a widening network of branches.

Talking about financial resources it has been observed that the paid-up capital and reserve have made meagre contribution to the total resources of Regional Rural Banks. Though during the initial period of operation, paid-up capital dominated the total resources but the proportion of capital has gone down in the subsequent years with greater stress on mobilisation of funds through deposits and borrowings.

The performance of Regional Rural Banks in Rajasthan regarding deposit mobilisation can be considered quite satisfactory.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

The contributory factors, sources of deposits and their types have also been examined.

Regional Rural Banks have failed to take maximum benefit of refinance facilities extended particularly by Agricultural Refinance and Development Corporation (now NABARD) and Industrial Development Bank of India, owing to shortage of technical staff to frame and implement approved schemes, as in the case of other States.

Regarding Lending Operations of Regional Rural Banks, in the State, it is analysed that they have simplified the procedure for granting loans. Loan camps are also being organised by Regional Rural Banks with a view to helping applicants in complying with various formalities.

Not a single Regional Rural Bank in Rajasthan has been able to attain the standard of credit as determined by the Government of India. The causative factors have been highlighted in the Chapter.

The growth rate of outstanding advances in aggregate for all Regional Rural Banks in the State has declined. Similar trend was largely observed in case of each Regional Rural Bank. Further, one of the important observations of lending operations is that about 75 per cent of total advances has gone directly to the weaker section of society. Besides Regional Rural Banks are playing a vital role in the implementation of several schemes aimed at improving economic conditions of the rural poor, viz., Integrated Rural Development Programme, loan to Scheduled Caste and Scheduled Tribes, loan under 20 Point Economic Programme etc. Thus, lending operations of Regional Rural Banks in Rajasthan are definitely in line with the objective for which they are set up.

The overall, Recovery performance was good in the beginning but it deteriorated later on. The reasons of decline have also been examined.

The observation regarding 'Management of Regional Rural Banks in Rajasthan' is similar to that in other States.

General administration and management of Regional Rural Banks in Rajasthan cannot be called efficient. Irregularity in attending Board Meeting (except by Directors representing sponsor banks), lack of active participation by directors, political and other considerations in appointment of Chairman and Director, favouritism, nepotism in recruitment of staff have emerged as burning issues which need prompt remedial measures with a view to strengthening the management set-up of the Regional Rural Banks in Rajasthan.

The investigations based on statistical analysis and interviews lead to several issues which have emerged and inferences have been drawn

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

which have been discussed in the relevant chapters. This has facilitated contemplation of certain recommendations for strengthening the effectiveness of the Regional Rural Banks. These recommendations have been summarised here :

AREA OF OPERATION AND BRANCH EXPANSION

(a) While taking decision about size of operational area to be alloted to each Regional Rural Bank, mainly three tests should be applied. These are economic growth in respective region, viability and management control.
(b) In order to identify the area where Branch Office of Regional Rural Bank is to be set up, State government in consultation with District Level Consultative Committees should consider the factors like spatial gaps in availability of banking facilities, population, availability of infrastructure facilities, potentiality for mobilisation of deposits and extension of credit facilities etc.
(c) With a view to improving the state of internal organisation and control mechanism, it is suggested that Regional Rural Banks, which have crossed the level of 100 branches should slow down the branch expansion programme.
(d) Establishment of 'LINK-BRANCH' for effective coordination and communication between Head Office and branches should be encouraged.
(e) A coordinated programme for branch expansion is necessary involving the Regional Rural Banks, National Bank for Agriculture and Rural Development and the State government.
(f) It is observed that the present working hours of branches are the same as for town branches which results in idle time and impedes field work. Hence, the working hours of rural branches should be adjusted according to the time which is more suitable to the prospective and existing clients.

FINANCIAL RESOURCES

PAID-UP CAPITAL

(a) To attain early viability it is suggested that minimum paid-up share capital should be increased.
(b) In order to ensure more successful working of Regional Rural Banks local participation in share capital should be allowed and encouraged.
(c) Greater involvement of the sponsoring bank in share capital is needed because the sponsoring bank is the prime mover with its major responsibilities in setting up of Regional Rural Banks.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

(b) National Bank for Agriculture and Rural Development, being the apex institution, should be allowed to participate in the share capital instead of Government of India.

(e) It is desirable that a minimum guaranteed dividend equivalent to the interest paid by Commercial Banks on one year's fixed deposit should be given to shareholders.

DEPOSIT MOBILISATION

(a) Regional Rural Banks should be allowed to extend certain percentage of credit assistance to well to do cultivators so that this section of rural population feels involved with these banks. This will ultimately push up tapping of deposits from this section.

(b) Regional Rural Banks should be declared 'APPROVED BANKS' for keeping surplus funds of Government of India, State Government, Local bodies and autonomous bodies and collection of pension of Government Officials.

(c) 'Deposit Camps' should be organised from time to time specially at the time of harvesting and marketing of crops.

(d) Implementation of innovative deposit schemes suitable for rural population and publicity campaigns should be initiated to create and develop banking habits.

BORROWINGS

(a) The original formula of refinance should remain in practice for ten years from the year of establishment of Regional Rural Banks. Then changes thereafter be made if needed after a thorough assessment of deposit mobilisation efforts and resources required by the Regional Rural Banks, once they get in stride.

(b) Sponsor banks should decrease the rate of interest, so that a large number of Regional Rural Banks can increasingly utilise borrowing facility.

(c) National Bank for Agriculture and Rural Development should introduce separate refinance schemes for Regional Rural Banks on soft terms.

(d) Industrial Development Bank of India should simplify its procedure for providing refinance to Regional Rural Banks and should grant 100 per cent refinance for eligible purposes.

(e) Composite loans for artisans and rural industries should be provided by National Bank for Agriculture and Rural Development instead of Industrial Development Bank of India.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

(f) Keeping in view that resources constraints do not come in the way of funding rural project, National Bank for Agriculture and Rural Development should adopt elastic approach to suit the requirements of individual Regional Rural Banks in the various regions.
(g) Guarantee cover by Deposit Insurance and Credit Guarantee Corporation for loans under Integrated Rural Development Programme should be raised from 75 per cent to 90 per cent.

OPERATION OF REGIONAL RURAL BANKS

PATTERN OF ADVANCES

(a) Coverage of Regional Rural Banks credit facilities to weaker sections should be widened and not remain confined to agriculture and allied activities. The procedural inconvenience and delay in identification of beneficiaries and in release of subsidies under Integrated Development Programme should be reduced.
(b) Regional Rural Banks should take immediate steps to set up technical cells with assistance from sponsor banks and National Bank for Agriculture and Rural Development, to formulate approved scheme for refinance and loans.
(c) Lending Policies framed by Regional Rural Banks should be based on socio-economic conditions of their operational areas.
(d) In order to develop tempo of granting credit, Regional Rural Banks should organise credit camps with the help of district administration where all the different schemes of the bank may be explained. Disbursement of loan should be made in the camp.
(e) Regional Rural Banks should develop effective monitoring system to ensure observance of the guidelines given by the Reserve Bank of India regarding security for loans to the weaker sections.
(f) Regional Rural Banks should adopt a uniform loan manual.
(g) Greater emphasis should be given on advances to rural industry and artisans.
(h) National Bank for Agriculture and Rural Develoment should take immediate steps to standardize and simplify loan document for composite advances.
(i) Deposit Insurance Credit Guarantee Corporation should expedite settlement of claims preferred by Regional Rural Banks. It should also hold training programmes for the staff of Regional Rural Banks.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

(j) National Bank for Agriculture and Rural Development should allow Regional Rural Banks to lend to a limited extent, to the non-target group to mobilise more deposits and to improve their viability.

(k) There should be a proper co-ordination of Regional Rural Banks with District Rural Development Agency, District Industry Centre, Zilla Parishad to get sufficient business. Regional Rural Banks should survey each village to locate the actual potential for lending and to formulate schemes for implementation.

(l) Repayment periods for different types of activities should strictly be follwed as per directive of National Bank for Agriculture and Rural Development.

(m) Regional Rural Banks should select a particular target group e.g. scheduled caste and scheduled tribes for financing specific activities for the successful implementation of the scheme of Differential Rate of Interest.

(n) Regional Rural Banks should increase their lending for consumption purposes, initially to needy borrowers to eliminate moneylenders.

(o) In order to ensure that a major portion of indirect credit by the Regional Rural Banks also goes to serve the credit needs of the society. The Primary Agricultural Credit Societies should provide at least a minimum percentage of their loans to the specified categories of the weaker sections, which form the potential clientele of the Regional Rural Banks. This must be strictly ensured by the Regional Rural Banks at the time of providing indirect credit to such Primary Agricultural Credit Societies.

(p) Regional Rural Banks should carry on their activities in the wider context as the friend, philosopher and guide of the rural people, trying to realise their problems in a sympathetic manner.

Recovery of Loans

(a) Direct rapport and close contact with the borrower is essential for loans to be repaid in proper time. Therefore, it is suggested that 'Recovery Supervisor' should be appointed in each bank.

(b) Central and State governments both should actively lend support to the recovery campaign in the same way as they take active interest in disbursement of loans.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

(c) Small loans should be granted to homogenous groups where reciprocal or group guarantee may be one weapon for recovery.

(d) The guarantee scheme of Deposit Insurance Credit Guarantee Corporation should be made available effectively.

(e) Efforts should be made in such a way that at any point of time recovery of Regional Rural Banks should not be less than 75 per cent.

VIABILITY AND PROFITABILITY

(a) In order to improve the viability and profitability of Regional Rural Banks it is essential to initiate effective control on expenditure.

(b) The cost of funds made available to Regional Rural Banks by sponsor banks and others should be reduced.

(c) Where the existing area of operation does not provide adequate business potential necessary to reach the viability level, the area must be extended.

(d) Lending should be on a schematic basis so as to facilitate obtaining of refinance from National Bank for Agriculture and Rural Development.

(e) Cash on hand at branch level should be kept at minimum which should not exceed 2 per cent of demand and time liabilities with a minimum of 5000 rupees.

(f) Opening of current deposit accounts with other banks (other than sponsor bank) should be restricted.

(g) Operational efficiency should be improved through vigorous efforts. Optimum utilisation of staff should be ensured.

(h) To make good the losses of Regional Rural Banks it is suggested that the losses incurred by a Regional Rural Bank should be made good annually by the shareholders viz. the Government of India, concerned State government and sponsor bank in the same proportion as their share holding.

MANAGEMENT OF REGIONAL RURAL BANKS

Chairman

(a) More effective norms should be introduced for appointment of chief executives of Regional Rural Banks to provide them with the right sort of leadership.

(b) To cope up with the growth in size and operations, the administrative set up should be strengthened at the head office by

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

creating position of District Manager in addition to General Manager.

Board of Directors

(a) Nominee directors should take an active part in the management and assist the Chairman in framing policy in respect of recruitment administration and growth of business.
(b) They should work as connecting link between Regional Rural Bank and sponsor bank and should bring to the notice of Chairman serious irregularities in the functioning of Regional Rural Banks.
(c) The nomination of at least 2 non-officials related to rural welfare and agricultural development should be made.
(d) The emphasis on nomination of officials should be changed in favour of specialists in rural Economics and Banking. Politicians or office bearers of political parties should not be nominated.

PERSONNEL MANAGEMENT

Man Power Planning

(a) The period of deputation of all categories of staff should be extended for a longer period.
(b) Officers deputed to the Regional Rural Banks must have a minimum of 3 years' experience of working in rural area.

Recruitment and Selection

(a) The sponsor bank should help the Regional Rural Banks in recruiting the personnel. Uniform recruitment and selection policies should be laid down.
(b) The selection of candidates with rural bias and attitude for serving in rural areas should be encouraged.

Training

(a) Sponsor bank must set up training centres. for the training of the personnel of a group of Regional Rural Banks.
(b) In order to have similarities in the content and duration of the induction course conducted by various sponsor banks, college of Agricultural Banking Pune, should give necessary guidelines and course models for the use of sponsor bank. This work may be taken over by the recently established Apex Training Institute by National Bank for Agriculture and Rural Development at Lucknow.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

(c) Field Supervisors and Officers should be provided with appropriate training in the specialised fields by the Apex Training Institutions in all the functional areas of management.

(d) Training should be held locally as far as possible or nearby places. Practical training should be given in the rural branches only.

Turnover of Staff and Promotion Policy

(a) To solve the problem of high rate of exodus of staff in Regional Rural Banks, it is suggested that a service bond to serve for a specific period be obtained from employees. More promotion avenues should be provided.

(b) Absence of a promotion policy has driven the more efficient ones to join other institutions. Hence, a definite policy of promotion needs to be formulated and implemented with immediate effect.

Unionism

(a) National Bank for Agriculture and Rural Development or Central Government should discuss the issues with the union and consider what is feasible within the broad framework of Regional Rural Banks. It will, however, not be possible for the Regional Rural Banks to pay their staff salary and allowances at par with the commercial Banks, otherwise their viability would be jeopardised.

(b) The management of each Regional Rural Bank should arrange a regular periodical dialogue with the unions and try as far as possible that all issues be sorted out by bilateral discussions in a spirit of give and take.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

ANALYSIS OF FINANCIAL STATEMENTS OF ALUMINIUM INDUSTRY IN INDIA

U.R. DAGA

Abstract of the thesis accepted by the University of Jodhpur
For award of Ph.D. in Commerce in the year 1985*

ALUMINIUM INDUSTRY OF INDIA

Aluminium is the most versatile of all metals. Because of its unique properties and easy availability, man is even trying to increase its usefulness through the avenues of fundamental research. Nature has endowed aluminium with a clean, pleasing surface and has provided an armour of protection in the form of Aluminium Oxide, which resists the attack of the time and elements present air, land and sea.

Aluminium is regarded as a very common place metal today and not many people realise that just over 125 years ago it was only a laboratory curiosity—a metal known to exist but hard to extract from its minerals and ores. History has recorded that the metal was more expensive than gold and was considered a coveted possession of the Kings and Emperors. Bars of aluminium were exhibited next to the crown jewels at the Paris Exposition of 1855, the first time the general people had ever seen or heard of aluminium. At that time it was priced at about Rs. 5700/- per kg. as compared to about Rs. 20/- per kg. at present and the total world production of the metal was reported to be 30 Kgs./annum as against the present world production of over 12 million tonnes/annum.

It is indeed a happy augury that aluminium is no longer very expensive but considered in the context of its remarkable combination of useful and versatile properties the metal is certainly very valuable and would continue to remain so. The list of uses of aluminium extends from A to Z in various diverse fields influencing and modifying the course of various industrial and human developments.

*This research work was done under the supervision of Professor D. N. Elhance, Ex-Vice-Chancellor, University of Jodhpur, Jodhpur.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

Unlike most other metals, over the years aluminium has maintained a remarkable price stability which has served as a powerful incentive for the development of new products made of aluminium or the adoption of aluminium to those uses for which ferrous and non-ferrous metals were conventionally used. In sharp contrast to other common non-ferrous metals like copper, lead, zinc, etc. the major and rich reserves of which are getting depleted at a very fast rate and the availability of many of these metals may present serious problems in another half a century or so; aluminium is plentiful and the supplies are assured owing to the abundant resources of bauxite which is the chief ore of the metal.

The Aluminium Industry, though of comparatively recent origin in India, has made tremendous strides to become the foremost non-ferrous metal industry in the Country. In India, a modest beginning in the production of primary aluminium was made in the year 1943. The actual increase in the production, however, started in India during 60s. The Industry took great strides during 1960's and 1970's. Some of the major factors responsible for the very rapid growth of Aluminium Industry in India have been :

(a) Potentiality of aluminium to replace copper, particularly in the electrical industries.
(b) Its stabilised prices over a relatively long period.
(c) Relative scarcity of other non-ferrous metals due to inadequate deposits of their ores.
(d) Extensive bauxite deposits in the Country.
(e) Increasing tempo of electrification and industrialisation in the Country—resulting in large demand for aluminium conductors.

There are three primary producers of aluminium in private sector at present :

1. Hindustan Aluminium Corporation Ltd. (HINDALCO)
2. Indian Aluminium Co. Ltd. (INDAL)
3. Madras Aluminium Co. Ltd. (MALCO)

In addition, Bharat Aluminium Co. Ltd. (BALCO) was incorporated as a public sector undertaking.

All the four operating units, producing aluminium have operated at different levels of capacity utilisation (Table 1.1). From the mid-seventies onwards, the performance of aluminium industry in India has been steadily deteriorating. Table 1.2 reveals unit-wise production of aluminium, their installed licenced capacity and capacity utilisation ratios.

Consumption of aluminium in our Country inspite of its known diversified uses has been abysmally low as compared to some of the

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

developed countries. As against a per capita consumption of 17 kgs in USA and 10 kgs in Canada, India consumed only 0.3 kg per capita in 1980.

The main factor behind the vicissitudes faced by the Aluminium Industry in India, is the difficult power situation. Aluminium is a power intensive industry. From time to time, supply of power to the smelters has been less than adequate, making them operate at a very low levels of capacity.

Hindustan Aluminium Corporation Ltd. was incorporated in 1958 and was formed by the House of Birlas in collaboration with the Kaiser Organization of U.S.A. The Company's Works are situated at Renukoot, District Mirzapur in U.P.

The Indian Aluminium Co. Ltd. was incorporated in 1938, under the name of 'Aluminium Production Company of India Ltd.,' and the name was changed to the present one in 1944. The Company was sponsored by Alcan Aluminium Ltd. of Canada. The Company's works are situated at Muri, Belgaum, Hirakund, Alupuram, Belur, Taloja and Kalwa.

The Madras Aluminium Co. Ltd. was incorporated in 1960. The Company entered into a collaboration agreement with M/s. Montecatiny of Italy. The Company's works are situated in the vicinity of Metur Dam, Tamil Nadu.

The Bharat Aluminium Co. Ltd.—the ambitious public sector project, on which more than Rs. 300 Crores have been invested so far, was incorporated in 1965. The Company owns works in the Korba Complex in M.P.

The present study relates to an analysis of the financial statements of all the three Aluminium Companies working in private sector for the period 1973-1982. These companies contribute nearly 80 per cent of the total production of aluminium in the Country.

FINANCIAL STATEMENTS

The financial statements provide a summary of the accounts of a business enterprise—the balance sheet reflecting the assets, liabilities and capital as of a certain date and income statement showing the results of operations during a certain period. The financial statements are the end products of financial accounting. They are summarised periodical reports of the financial and operative data. The major and independent forms of financial statements which are vital to financial analysis are the Income Statement and the Balance Sheet. These are the records of operative performance with its impact on the financial position. The balance sheet port-

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

rays the financial condition of a concern at a given date. It actually represents a combination of recorded facts, accounting conventions, and personal judgements. The Income Statement is a performance report recording the changes in income, expenses, profits and losses, as a result of business operations during the year—between two balance-sheet dates. Both these financial statements are equally important to study the results of business activity and its impact upon the financial position of a concern.

By nature, financial statements are summaries of the items recorded in the books of accounts prepared and presented periodically. The financial statements are composed of data which are the result of a combination of recorded facts concerning business transactions, conventions adopted to facilitate the accounting technique, postulates, or assumptions, made to implement the conventional procedures, and personal judgements used in the application of the conventions and postulates. The accounting principles are followed consistently so as to make the financial data comparable. These statements represent an amalgam of facts which govern the recording of business transactions.

Every business enterprise prepares the financial statements at the end of accounting period. There are several factors which lead to the preparation of financial statements like–representative management in case of Joint Stock Companies, Government regulation, Tax legislation, regulation of Stock Exchanges, etc.

Financial Statements are the blue-prints of the financial affairs. For the public, they are a window on the management of companies in as much as they reveal many facts about the financial development of companies, to the owners – they reveal its progress as evidenced by earnings and current financial conditions, to the management – they are its eyes in as much as they reveal the strength and weaknesses in the light of which the management can take appropriate steps to set the matters right, to the prospective investor – they serve as a mirror reflecting potential investment opportunity. The financial analysts and research workers are interested in published financial statements for guiding management or for establishing certain principles. They can peep through these statements into the financial policies pursued by the management and offer constructive suggestions to overcome the financial problems. To the Government these statements offer a basis of taxation and control of costs, prices and profits.

Financial Statements are essentially interim reports prepared for an accounting period. These statements are neither complete nor accurate as the flow of income and expenses is artificially cut-off at

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

the Balance Sheet date. They do not provide sufficient data for the assessment of the performance of a business enterprise. Again, these statements are prepared on historical cost basis and as such the impact of price level changes is completely ignored. Besides, the financial statements of companies having more than one factory or carrying on different type of manufacturing activities do not contain details of working and financial position for each factory or manufacturing activity. Hence, a comparative study of different units working in the concern cannot be made.

There are two focal elements in a good financial statement—disclosure and readability. Disclosure is a principle of financial reporting and includes itemization and explanations.

The Aluminium Companies in India prepare their annual reports in the form prescribed under Schedule VI Part I and II of the Indian Companies Act of 1956.

TECHNIQUE OF FINANCIAL ANALYSIS

Financial Statement analysis is an information processing system designed to provide data for decision makers. It is a process of synthesis and summarisation of financial and operative data with a view to getting an insight into operative activities of a business enterprise. It is a technique of X-raying the financial position as well as progress of a company. By establishing strategic relationship between the components of Balance Sheet and Profit and Loss Account and other operative data, it unveils the meaning and significance of the various items embodied in the financial statements. The major financial statements are the Balance Sheet and Profit and Loss Account. An analysis of both these statements gives a comprehensive understanding of business enterprises' operations and their impact on the financial health. The financial statements may be said to be a locked storehouse of valuable financial informations and if the key of financial analysis is applied to it, the storehouse would be opened for the benefit of all.

The analysis of financial statements of a business enterprise may be conducted either internally or externally. In internal analysis, the analysis is accomplished by those who are within the enterprise and have access to detailed records and all other information related to the business. This analysis is primarily conducted for managerial purposes. External Analysis, on the other hand, is conducted by those or for those who are outside the business enterprise. The main purpose of external analysis is to provide reasonable clues and answers to specific questions posed by problems of interest to the analyst.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

The process of analysis involves the use of analytical techniques and tools. The process has to be a flexible one tailored to the needs of specific situation. The initial step in the financial analysis technique is the reorganisation and re-arrangement of the financial data as embodied in the financial statements. This calls for the breaking down of individual components of financial statements and reducing them into groups of few principal elements according to their resemblances and affinities. The next step is the establishment of significant relationships between the individual components of Profit and Loss Account and Balance Sheet. This is done through the application of tools of financial analysis like Ratio, Common Size, Trend and Fund-Flow, etc. Finally, the significance of comparative data obtained by applying tools of financial analysis is evaluated. This requires the establishment of standards with which the comparative data can be measured and evaluated. The standards so established guide the analyst in understanding the sound as well as unsound relationships reflected by comparative data obtained from the financial statements. The specific conclusions arrived at as a result of financial analysis are presented in the form of a report which highlights the financial situation in which the enterprise is sailing and the possible steps to overcome the financial malady if it is there.

The analysis of financial statements spotlights the significant facts and relationships concerning managerial performance, corporate efficiency, financial strength and weakness, and credit-worthiness. Aims of financial analysis vary according to type of users. In financial analysis strategic relations between the different items of Profit and Loss Account and Balance Sheet are calculated through the application of the following tools of financial analysis :

(a) Ratio Technique
(b) Common Size Analysis—Vertical Analysis
(c) Trend Analysis—Horizontal Analysis
(d) Fund-Flow Analysis

Financial or Accounting Ratios are relationships, expressed in mathematical terms, between figures which have a cause and effect relationship or which are connected with each other in some manner. A ratio shows an arithmatical relationship between two figures. The major objective of ratio analysis is considered to be the facilitation of financial statement interpretation. The ratio analysis technique relates the absolute values of financial items to common bases, allowing a meaningful comparison of financial data both over time and across firms for a given time period. The technique of ratio analysis involves four steps, viz., determining

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

the accounting ratio to be used, computation of the ratio, comparison of the ratio with the standard set as a reference level and interpretation. Interpretation of ratio requires a careful study and judgement on the part of analyst.

Financial ratios may be classified by the source of data as :

(a) Position Statement Ratios (Balance Sheet Ratios)
(b) Income Statement Ratios
(c) Inter-Statement Ratios (Mixed Ratios)

Ratios, as tools for establishing true profitability and financial position, may be classified as :

(a) Profitability Ratios
(b) Financial Ratios
(c) Activity, Efficiency or Turnover Ratios
(d) Capital Structure or Financial Leverage Ratios

Profitability ratios are designed for the evaluation of the firm's operational performance. They indicate the net returns on sales and assets. Financial ratios indicate the Company's capacity to meet its long-term and short-term debt obligations. Activity ratios indicate how effectively the Company is using its total assets. The main idea behind capital structure ratios is to compare the composition of capital employed. Ratios provide a co-ordinated frame of reference for the financial manager.

In common size analysis individual items of profit and loss account and balance sheet are reduced to a common base which is treated as equivalent to hundred. A statement prepared under this technique is known as component percentage statement. The technique throws a flood of light on the structure of balance sheet and profit and loss account.

In trend analysis, also known as horizontal analysis, financial ratios are studied for a specified number of years. It is a dynamic analysis depicting the changes over a period of stated years. In fact, this method of analysis reveals direction in financial data.

In funds flow analysis a statement popularly known as the 'funds flow statement' is prepared. This statement is a condensed report of how the activities of the business have been financed and how the financial resources have been used during the period covered by statement. It is an operating statement as it summarises the financial activities for a period. It shows the ebb and flow of funds into and out of a business.

The data used in the present study have been obtained from the Annual Reports of the Aluminium Companies. The individual items of profit and loss account and balance sheet have been

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

combined and grouped together so as to reduce them into principal elements. For purposes of analysis in the present study, ratio technique has been adopted, and common size analysis for studying the behaviour of ratios over a period of 10 years, i.e. from 1973 to 1982, have been applied.

PROFITABILITY

The concept of 'Profitability' may be defined as the ability of a given investment to earn a return from its use. To measure profitability of aluminium companies in India, following ratios have been calculated :

a) Earning Power Ratio
b) Net Profit to Total Assets Ratio
c) Return on Long-term Investments Ratio
d) Net Profit to Net Worth Ratio
e) Net Profit to Equity Ratio

The first two ratios are important from managerial point of view, the third from long-term investors' point of view, and the fourth and fifth from owners' point of view. The owners are also interested in the third ratio on account of the factor of capital structural leverage.

The earning power ratio of aluminium companies ranged between 4.9 per cent and 16.9 per cent. There were wide fluctuations in earning power over the period as also amongst manufacturers. The earning power of aluminium industry has been greatly affected by the pricing policy adopted by the Government. The retention price fixed by the Government for each primary producer is not revised appropriately and in time in consonance with the increase in the cost of various inputs. Without a timely corresponding revision of the retention prices, the primary producers have to continue to produce and sell metal at a price which is not remunerative. The operation of price control on aluminium has shown lengthening delays in compensating producers for cost increases. Because costs continued to rise during the delay, much of the earning that the formula aimed to give was eroded by the time compensation was granted. This sequence of rising costs, chasing and overtaking controlled selling prices is the root cause of industry's low and fluctuating earning power. Another factor that has resulted in lower and widely fluctuating earning power in aluminium industry is power. The earning power ratio of different aluminium companies varies widely. As power constitutes the most important element in the cost of production (more than a third of the cost of production) and since the electricity tariff for different

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

aluminium producers varies widely, they have widely divergent costs of production and this results in difference in earning power of various companies.

To ascertain whether the rate of return on long-term investments had been adequate or not, this rate has to be compared with the rate of interest prevalent in the market. This comparison could not be done in case of aluminium companies in India, as it was not possible to know about the exact rate of interest paid on long-term borrowings as the figure of interest given in published statements includes interest paid on short-term borrowing, also. The question of appropriateness of investments in long term investments was treated with the help of interest-coverage test ratio. Interest coverage was found to have been closely associated with the profitability.

On making a comparison between the ratio of net profit to net profit to net worth and rate of return on long-term investments in aluminium industry, it was noticed that the ratio of net profit to net worth was always less than the rate of return on long-term investment. This indicates that the capital structural leverage always worked in the negative direction in aluminium industry during the period of study. But in case of Indal, the ratio of net profit to net worth always exceeded the rate of return on long-term investments indicating a positive direction of capital structural leverage.

In order to judge the adequacy of return on net worth in Indian Aluminium Industry, a comparison was made between the net profit to net worth ratio of other industries and of aluminium industry. The rate of return on owned fundes in aluminium industry lagged behind by 4.5 per cent in 1973, by 4.7 per cent in 1974, and by 3.4 per cent during the year 1975. The rate of return in aluminium industry was higher in 1976, 1978 and 1979. The rate of return was fairly consistent only in case of Indal.

Net Profit to Equity ratio was computed and it was compared with the ratio of net profit to net worth. It was noticed that the latter always exceeded the former and this confirmed the fact of negative capital structure leverage.

The Aluminium industry in India recorded a meagre average return of 5.23 per cent on its total resources employed. It was too meagre in comparison to the standard norm of 10-12 per cent return on total assets. The overall trend of profitability showed a sharp decline. The declining trend in the sales margin can be attributed to the rising trend of operating ratio sales did show an increase but that was enveloped by rising operating costs. The

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

reason for sales not increasing to such an extent as to leave a rising trend in the sales margin was that the prices were statutorily controlled and due to operational difficulty created by frequent power cuts, production, too, did not increase with rapid pace.

The aluminium industry in India had passed through troubled times. The industry had fared dismally during the period of study. The main reasons for the malaise plaguing the industry had been recurring bouts of power crisis, pricing policy that is slow to respond to the escalations in input costs and frequent tinkering with the tax rates. To overcome these problems, it is suggested that :

(a) A specified quantum of power generated by centrally owned power stations be allocated to aluminium smelters.

(b) Facilities of captive power be strengthened/expanded and for encouraging it appropriate fiscal incentives be provided since the cost of power generated on captive basis is likely to be higher by nature, proper subsidies in the form of excise rebate be allowed.

(c) State Electricity Boards should be made agreeable to supply power to aluminium smelters on a priority basis and at lower rates keeping in view the high load factor supply. SEBs may be suitably compensated for loss owing to cheaper supply of power.

(d) Retention prices should be automatically adjusted for increases in the cost of those inputs which are supplied by Government owned/controlled agencies.

(e) In fixing retention prices, the BICP should use a depreciation component derived from the replacement cost of equipment so as to check the erosion of real capital.

(f) The pricing policy needs to be made more realistic in the sense that the return allowed to this capital-intensive industry should be at least 16 per cent to enable the industry to plough back sufficient funds for replacements and rehabilitations.

(g) Aluminium products other than ingots and wire rods should be kept outside the pale of price control.

(h) The Government should levy excise duty on C.G. grade aluminium on a specific basis (based on weight) instead on *ad-valorem* basis.

(i) The manufacturers should introduce proper cost control techniques to bring down and control their costs.

(j) The manufacturers should try to reduce the cost of utilities which are abnormally high.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

(k) Imports of aluminium for execution of IDA financed contracts should be stopped instead the supplies be arranged from the indigeneous manufacturers by subsidising them through the operation of Aluminium Regulation Account.

(l) Aluminium manufacturers should set up 'Recovery Department' in their units to regain what is being lost in manufacturing process. Similarly, the activities of R. & D. Department and Economy Department be enlarged and more rigorously carried.

DIVIDEND DISBURSEMENTS

Dividend disbursement is based on the dividend policy followed by the management from the time to time. While framing such a policy, the management has to comply with legal requirements and has to consider objectives like solvency, stability of earnings and growth the company may seek to achieve.

In present study, following accounting ratios have been used to study the dividend disbursements by aluminium companies in India :

a) Dividend Payout Ratio
b) Dividend to Paid-up Capital Ratio
c) Dividend Yield Ratio.

The first ratio is important from the view point of the management, the second from that of shareholders and the third from that of the future investors.

The dividend payout ratio in aluminium industry ranged between 46.76 per cent to 129.56 per cent of current year's net profit during the period of study. The ratio was more than 100 during the years 1973, 1980 and 1982 which indicates that the dividend was paid out of earlier years' retained earnings to the extent the figure exceeded 100. During the years 1973 and 1974, the retention prices fixed statutorily, remained frozen at the level of 1970, whereas the prices of inputs continued to rise steeply, leading to increased costs of production and thereby eroding industry's profitability. During the year 1980, also price revision was not carried out and the retention prices fixed in 1978 were continued whereas the cost of production had gone up considerably leading to a severe fall in the earning power and consequently the industry had to draw from retained earnings of earlier years to pay dividends. The ratio had remained less than 70 during the years 1975-1979. This indicates that more than 30 per cent profits were retained in the industry. This can be explained in two ways—firstly, the profita-

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

bility of the industry was high during the period and the quantum of profits available were high and as such reasonable dividends could be declared even by drawing less profits, secondly, the industry embanked upon expansion programmes during these years and as such retained earnings were used to finance the expansion programmes.

The dividend payout ratio in aluminium industry during the period of study has remained higher in comparison to the all industries' level. The overall increasing trend of the ratio can be attributed to the declining trened of net profits after tax.

The equity shareholders of aluminium companies in India received on an average a dividend of 11 per cent on their paid-up share capital during 1973-1982 period. The dividend rates varied between 5.89 per cent and 19.62 per cent. In individual units, Hindalco's rate averaged 8 per cent against 11.3 per cent for the industry. The company could not pay any dividend in 1973-1975 period because of inadequate earnings. Indian Aluminium Company recorded a higher average percentage of equity dividend (15.6 per cent) and the Company had been regularly paying dividends. But Hindalco adopted a relatively more stable dividend policy than Inaian Aluminium Co. The Madras Aluminium Co. did not declare any dividend on its equity shares during the entire period of study. The Company had incurred huge losses in 1977, 1981 and 1982. Even in remaining years, too, the EPS was meagre and was hot enough to even write-off accumulated losses. Management had no option except to skip dividends, to conserve cash resources.

The equity share market prices of aluminium companies (except Madras Aluminium Co.) exceeded the nominal value. The share market prices registered an upward trend in general indicating that the share market prices of these companies found favour from investors in the stock exchange markets. On account of rise in share market prices of Hindalco and Indal the dividend yield ratio was lower in comparison to the dividend to paid up capital ratio. The share market prices of the Madras Aluminium Company registered a constant decline, mainly because of poor profitability and non-declaration of dividends.

It is suggested that the Government takes a realistic view of the situation prevalent in aluminium industry and make rational changes in its policies so that the industry may earn sufficient profits to pay reasonable dividends. More fiscal concessions should be given to aluminium industry.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

FINANCIAL STRUCTURE

'Financial Structure' refers to the make-up of 'total liabilities' reflecting the various types of sources tapped to finance the total investments. The term 'capital structure' refers to that part of financial structure which is represented by long term funds like equity capital, preference share capital, retained earnings and long-term debt.

In analysing the financial structure of the Indian Aluminium Industry the basic approach has been to analyse it in terms of long-term and short-term funds, capital gearing and trading on equity.

The long-term funds constitute the major source of financing the assets employed in the Aluminium Industry in India. But the proportions of long-term finance as a percentage of total assets during the period of study were fluctuating and the overall trend was declining.

The proportion of sundry creditors and short-term loans and advances had gone up considerably. The increasing trend of short-term loans and advances and sundry creditors brought the increase in the overall trend of short-term funds during the period under study.

Hindalco presented the highest average investment of long-term as 66.9 per cent of the total investment was represented by such funds. It was followed by the Indian Aluminium Company (65.3 per cent). The Madras Aluminium Company had the lowest average investment of long-term funds (59 per cent). In all the units the long-term funds exceeded the quantum of fixed assets. Since the proportion of long-term funds employed (66 per cent) exceeded the proportion of fixed assets (52.1 per cent), it can be concluded that long-term funds were adequate and sufficient to finance the average total fixed assets in the aluminium industry in India during 1973-82.

The Aluminium Industry in India employed on an average 52.2 per cent of total investments from equity shareholders' funds and 13.8 per cent on an average from long-term borrowings and preference share capital. It is, therefore, clear that the proportion of equity interest was comparatively larger and as such capital was low geared. All the units adopted the practice of low gearing of capital. It seems that the management of aluminium companies in general was cautious and did not want to undertake risk and as such the proportion of long-term loans and preference share capital was very low.

In India's aluminium industry, on an average the ratio of net-worth to long-term debt was 5.91 times which means that the

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

owners' equity was almost six times the interest of long term lenders. The capital structure therefore, was conservative in view of this low rate of borrowed funds.

The policy of employing lower proportion of long-term borrowed funds was justified in view of the instability and unpredictability of earnings because of ever-escalating input costs on the one hand and controlled retention prices of primary metal on the other hand.

The aluminium industry in India recorded on an average debt-equity ratio of 1.28, on taking into account both long and short term debts, whereas the ratio was 5.91 when only long term borrowings were included in debt which means that the industry had a larger proportion of short-term borrowings as compared to long term borrowings. The trend of the ratio registered a decline indicating the fact that increasing proportion of short-term debt had been employed every year.

The Industry could not reap the benefits of trading on equity on account of the instable, inadequate and unpredictable nature of earnings. The employment of borrowed capital did not enhance the profitability of owned funds—the prime purpose of resorting to trading on equity—and this fact dissuaded the managements to resort to trading on equity.

The creditors equity on an average was about 45 per cent while the owners' share was about 55 per cent. As such the long term solvency of the aluminium industry in India could be considered satisfactory and the financial structure relatively more strong.

WORKING CAPITAL

Working Capital refers to short-term funds required for financing the duration of the operative cycle in a business, often known as 'accounting year'. There are two aspects of it—quantitative and qualitative. The quantitative approach concerns with the quantum of current assets whereas the qualitative aspect concerns with the excess of current assets over current liabilities.

From the financial management point of view total current assets reflect the quantum of working capital. The management strives hard to utilise the investment in the current assets to the maximum so as to maintain the circular flow of current assets. From the liquidity point of view, net current assets approach is preferred.

In the present study working capital has been analysed from the financial management point of view and creditors point of view. The structure of current assets and their utilisation has been examined. To judge the liquidity, the quantum of working

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

capital during the period of study have been analysed. The adequacy of working capital has been tested through the sales to working capital and inventory to sales ratios. The short-term solvency has been evaluated through the use of current ratio, quick ratio and collection index.

Current assets represent on an average 46 per cent of total investments. As the trend of the current assets' proportion increased in the combined position it is imperative that they were inviting more and more funds. Inventories formed a major component of current assets as it represented 58 per cent of the current assets. The average investment in current assets was lower than in fixed assets.

A study of the individual units shows that investment in current assets varied form 41.4 per cent of total assets in Hindalco to 52.5 per cent in Indal. However, only in Indal the quantum of current assets was more than fixed assets.

Inventories formed the major item of current assets in the combined position, as it was 26.54 per cent of the total assets and 58 per cent of the total current assets invested therein. A study of the individual units showed that in Indal and Madras Aluminium, inventories exceeded 60 per cent of total current assets invested in these units.

The combined position revealed a declining efficiency in the utilisation of current assets. This was not due to mounting inventories but due to poor sales.

A study of the working capital position of the individual units reveals that Indal's position regarding working capital adequacy was relatively much better. The unit maintained a stable and consistent trend in employment of working capital. The trend of the quantum of working capital was increasingly showing progressive improvement in working capital position. The operating efficiency in the unit was comparatively higher and, therefore, it could conserve the current assets properly.

The working capital position of Hindalco was quite satisfactory in the year 1973, but due to boosting of current liabilities constantly, the situation became worst in 1982 and practically the unit had no working capital at end. The trend of quantum of working capital in it was declining. Frequent power cuts imposed on the unit, ever-escalating cost of inputs and low retention price of primary metal not only resulted in mounting trade liabilities but also eroded liquid resources of the unit and it had to face a severe shortage of working capital.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

The situation at the Madras Aluminium Co. was even worse. It recorded deficit of working capital in 5 years out of 10 years under study. For the reasons that were responsible for Hindalco's working capital shortage, the fixed assets of the unit did not generate sufficient current assets and the unit faced a working capital-crisis situation.

The liquidity of the Aluminium Industry in India was weak. The combined position of the Industry revealed that in none of the years, the current ratio and quick ratio touched the norms of 2 : 1 and 1 : 1. The same was the situation in individual units. It means that the claims of current creditors were not well protected. Mounting inventories in the last two years, had deflated the quick-ratio substantially.

The period of credit allowed by the Industry was 32 days. But this cannot be justified as the current ratio and quick ratio, in combined position as well as for individual units, did not touch the norm. In case of Indal and Madras Aluminium, in view of precarious liquid position, period of credit allowed was, particularly, unjustified. Indal followed a very liberal policy in respect of period of credit allowed in the last 2 years (Collection Index being 56 and 64) of the study and in these very years its liquidity declined as is clear from the declining current and quick ratio, its credit policy in last 2 years cannot be said to be justified.

Suggestions

The general trend of quantum of working capital in the Aluminium Industry was declining. Frequent power cuts imposed on the Industry, ever-escalating cost of inputs and low retention price of primary metal not only resulted in mounting trade liabilities but also eroded liquid resources resulting in working capital shortage. To improve the situation it is suggested that :

(a) Operating costs should be reduced and effectively controlled so that the Industry may generate sufficient funds to finance its normal capital replacements and contribute enough cash for meeting day to day working requirements.

(b) Adequate and uninterrupted power supply to smelters should be ensured so that production and sales may be boosted to a satisfactory level so that working capital utilisation position is improved with adequate cash generations.

(c) The excise duty on aluminium should be levied on a more rational and reasonable basis. It should be brought down atleast to the level of other similar basic raw materials, so

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

that the [demand of metal is increased, profit margins become relatively better and adequate cash resources are generated.

(d) Enough financial incentives should also be provided by the Government to expand production and sales in aluminium units. This shall add to the depleted reservior of working capital in India's aluminium Industry.

GROWTH PROSPECTS

Among the major non-ferrous metals, India has been placed in a happy position only in respect of aluminium. The bauxite reserves in the Country are enormous and the capacity already created is enough to ensure adequate supplies to meet our domestic needs. In fact, when Orissa project goes on strem in the next few years, we may have to tap overseas markets in addition to boosting the end applications of the metal at home to cope with the high volume of production. Yet, the track record is far from satisfactory. The smelters have been denied adequate and un-interrupted power supplies with the result India had to resort to wholly avoidable imports just to bridge the gap between demand and indigenous supplies. This is in respect of a primary metal in which self sufficiency is easily within reach.

In addition, the domestic offtake of the metal has been artificially held in check by the high cost of production and high incidence of taxes. The price of aluminium is statutorily controlled which is not revised appropriately and in time in consonance with the increase in the cost of various inputs. Thus, if the aluminium production is to maintain a rising tempo, apart from dependable and adequate supply of power to smelters, there is a need for a realistic pricing policy that should reflect the cost of inputs. To boost demand, the metal should be made available to the consumers at reasonable price.

A synoptic account of the production targets and performance in respect of aluminium during the recent past, reveals that the production has stagnated at around 2 lakh tonnes for quite some time now. The stagnation in production has been accompanied by low-key demand for the metal. This sluggish offtake has been primarily because of the inability of the State Electricity Boards to place orders for EC grade metal because of financial stringency. The sale of CG grade aluminium has been affected by the high price of aluminium.

Fortunately, India is in a happy position as far as the bauxite reserves are concerned. According to the latest estimate, with the discovery of bauxite in east-coast region, our known reserves

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

of this key raw material are put at 2489 million tonnes—most of which are of metallurgical grade. Given this order of bauxite reserves, there is tremendous scope for boosting production and consumption of aluminium metal in the country.

At present, the metal finds only limited applications here. According to experts, the end uses of aluminium hardly number 300 in India, as compared to more than 30000 uses of metal in advanced countries. The challenge of the future will be to evolve a rational pricing policy and promote newer uses for the metal to stimulate demand. Although, the appetite for power for manufacturing aluminium is truly gargantuan, it is extremely energy saving in use; and this attribute of the metal has been tapped to maximum advantage in advanced countries. In India, bulk of demand, more than 50 persent is now accounted for by power sectors towards the manufacture of cables and conductors. Its application in transportation, packaging, construction, etc. are very limited here. It is necessary to put the metal to a variety of applications, apart from the traditional sectors like power. Following table indicates the pattern of aluminium consumption in India and selected countries :

Aluminium : Pattern of Consumption in Selected Countries
(Per cent to Total Consumption)

	India	U.S.A.	Japan	U.K.
Electrical	50	13	12	13
Transport	11	19	19	32
Building and Construction	3	25	30	9
Consumer Durables	18	10	20	11
Canning and Packaging	7	15	5	7
Miscellaneous	11	18	14	28
Total	100	100	100	100

The data in this table are very revealing. They show that considerable strides have been made by Japan and U.S.A. in using this metal in transportation, building and construction activities; whereas in India, only limited use of the metal has been made in these sectors. If the demand is to be stimulated, the product/market development for aluminium has to be accorded high priority.

The per capita primary aluminium production of the world is 5.18 kg. while that of India is only 0.34 kg. The situation appears to be ironical keeping in view the vast and rich deposits of bauxite in the Country. It is surprising to note that while India's share of

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

global bauxite reserves is 8 per cent, it manufactures only 1.5 per cent of global aluminium production. In fact, our miserable aluminium use is an index of our low energy conservation conscionsness. By not using more aluminium in transportation and packing, we are actually wasting enormous quantities of precious fuel, oil and energy. An aluminium truck body allows haulage of an extra 1.2 tonnes of pay load for the same amount of fuel every time it hauls load. There are about 5,00,000 trucks in the country hauling 86 billion-tonne-kilometers by road. Less than 500 of them have aluminium bodies and we can just imagine the magnitude of wastage.

Pressure gas vessels is another example. Whether it is LPG for the householder or Oxygen for the army, when we transport gas in India, we are actually pushing around tonnes and tonnes of steel. We can again work out the savings in haulage energy if aluminium is used.

Aluminium offers the possibilities of conservation of precious fuel and power through its applications in the utensils, pressure cookers and transportation industries due to its excellent conductivity of heat and its being much lighter in weight than steel. Further, its electrical conductivity enables the substitution of copper which has to be imported, in the manufacture of cables and conductors.

There is vast potential for developing the use of aluminium in India as has been done in other developed countries. Considering the vast potentialities of this metal and hence of this industry, clear policy guidelines need to be outlined for it and a speedier mechanism is provided so as to remedy the grievances of the industry and keep it in healty condition. Viewed in this perspective, the current poor showing in aluminium is likely to be transitory. Within the next few years, indigenous production may exceed home demand and we may have to tap export outlets for the surplus metal.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

MARKETING OF WOOL IN ARID AND SEMI-ARID AREAS : A STUDY OF WESTERN RAJASTHAN

ASHOK SINGHVI

Abstract of the thesis accepted by the University of Jodhpur
For award of Ph.D. in Commerce in the year 1985*

WHY WOOL ?

Wool is to western Rajasthan what tea is to Assam or coal is to Bihar. Wool is the fulcrum around which the entire socio-economic life of the overwhelming bulk of population in western Rajasthan revolves—especially of the poor, backward, weaker, underprivileged. It was, therefore, thought that a study that helps suggest not only increased output of wool but just, remunerative and equitable return on it would go a long way in ameliorating the lot of the disorganised have nots in backward environment, eking out miserable existence for generations on end.

It is to help these helpless helping themselves that a modest attemp has been made to study, in comparative depth the various facets of this all embracing village way of life, for that is what wool stands for, in western Rajasthan. In fact, the socio-economic goal of establishing an egalitarian society in this part of be country, without study of wool and its marketing would the devoid of its essential content.

PRELUDE

Human population has been living in balance with natural environment in India's arid zone since centuries. Balance being maintained sometimes by natural and at others by the adjustment mechanisms adopted by the desert inhabitants. History has it on record that man not only lived in this desert since ancient times but great civilizations flourised in the region. Studies conducted in the Indian desert have revealed that ecological

*This research work was done under the supervision of Dr. U. L. Gupta, Associate Professor of Commerce, University of Jodhpur, Jodhpur.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

deterioration and accentuation of desertification has occurred in the region in recent times due to intense human and livestock pressure.

Economic, social and political considerations shape the multifarious problems involved in developing arid areas. The problems of economic development are conditioned by physical characteristics, the hot Indian arid zone being characterised by low and erratic percipitation, frequent occurrence of drought, high temperature with high wind velocity resulting in severe kind of wind erosion hazards. The land forms comprise barren rocky stretches, vast sand dune areas and undulating topography. Drinking water is scarce. The sub soil water level is often too low and has high salt content. The economic problems have also a human dimension and most of them are embedded in the social structure of the population inhabiting the desert areas. By arid zone standards the Indian arid zone is most thickly populated. That in the process of eking out existence more and more marginal lands have been exploited to affect accentuation in desertification in the region. There also has been a breakdown in the traditional social fabric so well knitted for the balanced use of eco system.

The exploratory study aims at : bringing into bold relief the large percentage of Rajasthan's wool production (it almost comes to 42%) of the country and yet because of dominance of middlemen the lion's share of this trade, which ought to go to the poor and backward rural populace, whose livelihood depends on animal husbandry, instead goes into the pockets of the business elite. The study elaborates the existing system of wool marketing in western Rajasthan. The questionnaire at the end is illustrative of the various issues involved in this thesis. The sheep breeders/ rearers were asked questions from the above. While interviewing them an attempt was made to elicit information about the entire marketing spectrum of wool in all its manifestations.

The study includes : the varied characteristics—historical, social, climatic, human settlement, about resource utilisation, etc. of the area under study. Sheep wool production, the marketing issues the different selling and management practices, the many connected governmental organisations—all these aspects, inter-alia, have been dealt with.

Besides, the dissertation attempts to focus attention on : sheep improvement programmes with special emphasis on breed development. As against the bulk of wool being exported out of Rajasthan, it has been suggested as to how it can be marketed

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

and used in the state itself with great benefit for the rural population. Thus, an approach has been evolved under which wool, besides agriculture, can play a vital, if not a decisive part in the lives of the backward and the underprivileged sections of the community, by transforming the entire socio-economic horizons in western Rajasthan.

RATIONALE

Markets are being explored fairly well in regions all over the world, but the western part of Indian subcontinent, particularly the extreme arid and semi-arid regions, has been sadly neglected in this regard.

Rural marketing in such region is bound to emerge as a major marketing operation as soon as the desired level of economic development is achieved as a result of various developmental plans and programmes being executed for the purpose. Since marketing has its own role to play in the development of an economy, the marketing operations will not only follow but have also to commence in certain respects fairly early inspite of problems that may have to be faced.

With an ensuing rise in income and education levels, there is bound to come about a change in the socio-economic values embracing almost every aspect of human behaviour which in turn will require consequential changes in marketing system.

The purpose of the present endeavour is, therefore, to study the marketing aspects in the arid and semi-arid area and to explore the possibilities of development therein, in the field of wool marketing and to suggest remedial measures in this regard.

CONTENTS

The thesis includes a brief outline of the topic and basic background information, on which the study is based upon. Various aspects relating to wool production, marketing and utilisation in arid Rajasthan have been dealt with in detail with illustrations and supporting data.

ISSUES AND POLICY IMPLICATION

1. *Relating to desert* : Certain solutions to the problems of the desert have been suggested basically in reducing dependence of agriculture on monsoon coupled with certain measures to reduce severity of drought conditions.
2. *Relating to sheep development* : In this arid area, the sheep is serving as drought insurance cover for the desert farmer. In

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

addition to wool, meat and skin, the sheep is providing employment to a large section of population for the shearing and wool based industry. Looking to these facts, logical steps have been suggested to improve the economic condition of poor people in desert area through sheep development programmes.

3. *Relating to wool production and quality* : The concept of sheep management on barren land for high production is a dream. For high production sheep, we have to manage it on arable land or bring out a special system of feeding and shading them on barren land. All the above factors need high financial input for development as well as marketing.

4. *Relating to marketing aspects* : Although a large number of schemes for increasing productivity in wool sector have been implemented, yet the economic condition has not materially improved. This seems partly due to insufficient growth of the infra-structure in desert areas and partly due to inadequate attention paid in these development programmes and schemes to the marketing of the wool. The marketing process as analysed in this work starts with the decision to rear sheeps and involves pre and post rearing operations. The four objectives identified of an efficient marketing system are :

   a) To enable the primary breeder to reap the best possible benefits.
   b) To provide facilities for lifting of all volume the breeder/ sheep farmers are willing to sell at an incentive price,
   c) To reduce the price spread between the primary producer and ultimate consumer, and
   d) To make available all grades of wool to consumer at reasonable price without impairing the quality of produce.

Other measures

Co-operativization of sheep breeders at the village level for pasture development, cross breeding programme and for grading and processing facilities.

Price support by the Government as in case of agricultural commodities to prevent the interest of sheep breeders and control the export of better body weight sheep for meat purposes. Wool marketing service should be introduced by the State's Co-operative Marketing Federation. It should advise to encourage industry wide adoption of innovations in procedures, wool handling, distribution and selling and at the same time maintain a competitive influence in wool market.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

5. *Relating to wool utilisation* : Certain structural changes have been suggested regarding wool marketing and utilisation outlined in the thesis.

Few areas for research have also been identified to undertake serious research in investigating all the problems of sheep and wool development revealed in the thesis in its entirity.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

LONG TERM CO-OPERATIVE LENDING IN RAJASTHAN : AN ANALYTICAL STUDY

SHRI VALLABH SHARMA

Abstract of the thesis accepted by the University of Jodhpur
For award of Ph.D. in Commerce in the year 1985*

In spite of its dominant role in the Indian economy, agriculture has failed to assume the role of the leading sector in the process of country's economic development for the many constraints it has been facing in the past. One of the main constraint has been the paucity and dearth of credit. It would be hard to deny the urgent need of evolving a suitable credit and incentive system to enable agriculturists to come forward and undertake hard-pressed long-term investment on land and put forth their best in agriculture and positioned it at those heights where its performance fully match the country economy's aspirations and needs.

The present system of agricultural credit in India consists of two sectors, i.e., institutional and non-institutional. The non-institutional sector consists mainly of the professional money-lenders, landlords, traders, commission agents, relatives and friends. The institutional sector comprises co-operative banks, commercial banks and the regional rural banks.

The Co-operative Land Mortgage Bank which has achieved success in Germany and other European Countries attracted the attention of the Government of India which had realised the need for having a separate long term credit agency. The first attempt to organise a Co-operative Land Mortgage Bank was made in Punjab in 1920. Since then many more banks of similar type have been established in different States. However, it was only in 1954 when the all India Rural Credit Survey Committee assigned the Land Mortgage Bank, the new role of supplying development finance to farmers. Hence, the

*This research work was done under the supervision of Dr. P.N. Saxena, Associate Professor of Commerce, University of Jodhpur, Jodhpur.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

year 1954 has been a landmark in history of Co-operative Land Development Bank in the country.

In the past, importance of long term lending was not felt as agriculture was in a primitive stage. Investment in agriculture was not considered adequately rewarding. However, the new innovation in agricultural technology have opened up vast opportunity for development of agriculture and now long term lending is considered essential and dynamic because it helps the farmers to add to the agriculture production of the country. We have, therefore, tried to analyse long term co-operative lending in Rajasthan which is mainly undertaken through the Land Development Bank. The Rajasthan Rajya Sahakari Bhoomi Vikas Bank Limited popularly known as State Land Development Bank was established in 1957. This is the only institution in the co-operative sector, which provides long facilities to the farmers. We have carried out an intensive study of the operation of Rajasthan State Land Development Bank during the decade encomprising the years 1972-82.

The main objectives of the present study are as under :

i) to trace the origin and development of Co-operative Land Development Banking in Rajasthan;

ii) to examine the organisational and managerial aspects and cost of management of the Rajasthan State Land Development Bank, with special focus on the problem of viability of primary Land Development Banks;

iii) to carry out an inter-state comparison of Land Development Banks in different states of India;

iv) to assess the growth of working capital of the Rajasthan State Land Development Bank and analyse the components of the working capital and the position of utilisation of funds;

v) to make a quantitative and qualitative appraisal of credit advanced and the problem of overdues of the Banks;

vi) to measure the growth of Bank's credit in various districts of the State; to make inter-district and inter-zonal comparison of credit levels and to identify the factors affecting growth of credit, and to establish their rank correlation;

vii) to compare regular membership as obtaining in different districts of the State; and

viii) to assess the share of weaker section (including small/marginal farmers and SC/ST farmers) in the total credit advanced by the Bank.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

Unfortunately, no scientific systematic and even a detailed study of long-term co-operative lending in Rajasthan (RSLDS) has been made so far.

The thesis is mainly based on the secondary data, given in various reports, circular and other records of Rajasthan State Land Development Bank. Further information has been specially collected by personal visits to the head office, zonal offices and through discussions with various officials. Besides, College of Agriculture, Pune, Reserve Bank of India, Ahemdabad and Bombay, Sardar Patel Institute of Economic and Social Research, Ahmedabad, IIM, Ahmedabad, NABARD Office, Jaipur and Parliament Library, New Delhi, were also visited to get penetration into the valuable literature. Visits to these Institutes and their libraries proved to be immensely useful.

Great care has been taken in the use of both published and unpublished data to make them more useful for a comparative and comprehensive study.

With a view to provide a comprehensive idea of the line of approach followed by us in our study, the chapter scheme is given below.

In the 1st chapter we have explained the salient features of the rural economy of Rajasthan including agricultural backwardness, rainfall and climates, soil classification, land use, irrigation, work force in agriculture, cropping pattern, improved agriculture and other related issues.

In the 2nd chapter we have traced the historical Development of Land Development Bank in Rajasthan, expansion of Co-operative credit, review of Land Development Bank in Rajasthan and its new dimensions and role of ARDC/NABARD in Rajasthan.

In the third chapter, we have analysed the organisation, structure and management of Land Development Bank in Rajasthan and an analysis of the viability of the branches and cost of management of the Bank.

Fourth chapter deals with the resource pattern of the Rajasthan State Land Development Bank, composition, management and utilisation of funds.

The fifth chapter, evaluates the loaning procedure adopted by the Land Development Bank, various issues interwined with loans, payment, repayment, utilisation and other problems.

The sixth chapter deals with an analysis of advances, purposes and quantum of advances, recoveries, problem of overdues and the position of schematic and ordinary loaning.

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

Seventh chapter has analysed the districtwise and inter-zonal advances, overdues, and factors responsible for inter-district variations.

The eighth chapter explains the role of Primary Land Development Banks in the upliftment of the weaker sections of the society.

CONCLUSIONS AND SUGGESTIONS

Rapid rural Development is a sine qua non of economic progress and advancement. Agriculture is the king pin for rural development. Indian agriculture has to confront the perennial problem of paucity of finance. For making available the requisite finance, the role of Land Development Bank becomes very important and vital. We have, in the present research work, attempted to undertake an intensive study of the working structure and impact of State Land Development Bank and Primary Land Development Banks on long term agricultural lendings in the State of Rajasthan.

The State Land Development Bank in Rajasthan through its 35 Primary Land Development Banks and 90 branches has of late assumed a place of importance in providing long term finance to the agricultural sector, which is evident if we have a look at the growth of membership, branches, funds advances and other such indicators. However, the performance of Rajasthan State Land Development Bank in Rajasthan has lagged behind as compared with Land Development Banks in other States of India. However, it is worth mentioning that there has been a notable progress during the last one decade.

The present two tier system of Land Development Bank in Rajasthan results in escalating the cost of operations and overhead charges, whereas a unitary system as is prevailing in some States helps in reducing the cost and overhead charges. Besides the Board of Directors of State Land Development Bank has been nominated by the Government which is inconsistent with the fundamental principles of democracy in co-operative movement but efforts must be made to have elected Directors so as to represent the wider interests.

The staffing pattern of the Rajasthan State Land Development Bank has not been based on any systematic method thereby resulting in overstaffing and making it unwieldy as well as uneconomical. The cost of management of State Land Development Bank and Primary Land Development Banks has grown quite rapidly and an in-depth study reveals that management

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

inefficiency has increased if considered in juxtaposition with the ratio of outstanding. Further, it has been observed that both at Rajasthan State Land Development Bank and Primary Land Development Bank level, the staff, is always, on a look out for better jobs due to lack of proper incentive and promotion schemes. As a result there is large amount of turnover, which results in inefficiency and additional expenditure on fresh recruitment as well as imparting them further training.

The loaning procedure adopted by the Primary Land Development Banks appear to be quite cumbersome, lengthy, time consuming and the labyrinth in procedural formalities which scares away the illiterate Indian farmers. The ceiling prescribed for various purposes has also become irrelevant due to the escalating price levels. The requirement of mortgage before giving loans is an inhibitory factor and restricts the farmers from utilising the loan facilities. Not only this, it suffers from several other deficiencies such as recovery performance of the Primary Land Development Banks is quite poor, proper utilisation of loans is not ensured, no auditing is carried out for loan expenditures. Again there is no proper co-ordination between short term credit and long term credit with the result that non-availability of short term credit at the appropriate time, creates a situation when even the long term credit cannot be properly utilised. Further on the basis of norms of Rs. 35 lakhs of outstanding loans for making a branch viable as suggested by the Committee on Co-operative Land Development Bank, 1975. We find that in 1981-82 out of 35 branches in the state, 32 are viable and only 3 i.e. Beawar, Pratapgarh and Nohar are non-viable.

However, the following points deserve a special mention :

1. Seven branches which have been classified under the category of viable branches, have incurred losses and one non-viable branch i.e. Pratapgarh has earned profit.
2. The analysis reveals that out of 35 branches, 18 branches show outstanding loans between the range of Rs. 200 to 400 lakhs.
3. The ratio analysis of various Primary Land Development Banks according to expenses as proportion of outstanding reveals a concentration of profit earning Primary Land Development Banks in the range of ratio between 1.5 to 4 per cent.

The resource analysis of Land Development Banks reveals that the share capital of the bank forms only a very insignificant

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

portion of the working capital. Not only this, it has shown a declining trend during the period under study. This is not a healthy sign.

Debentures constitute about 89 per cent of the total working capital. However, we find that the Government and other financial institutions alone have subscribed to these debentures. There is no public involvement in both ordinary as well as special development debentures. Rural debenture had not been popular at all and were issued only four times till today.

The working capital has increased by more than five times during the period under study and the notable feature is that the share per member, has also shown an increasing trend.

The new system of giving short term accommodation to the Primary Land Development Banks by the Central Co-operative Bank in Rajasthan is not satisfactory because the Primary Land Development Banks loose heavy amount by way of interest in the whole process.

An analysis of utilisation of funds clearly points out that the ratio of loans outstanding to resources has gradually declined and this means that idle funds are increasing. The lending policies and procedure of Primary Land Development Banks suffer from several weaknesses namely :

a) Proper records in respect of loan applications have not been maintained.
b) Several Primary Land Development Banks do not maintain land mortgage register.
c) The verification of utilisation of loans has not been done in many cases.
d) In many cases the prices paid by the Primary Land Development Banks directly to dealers for the same brand of pump sets and diesel engines have differed from district to district.
e) The repaying capacity of the borrower has not been fixed in a realistic manner.

There has been a spectacular increase in the quantum of advances given through the Primary Land Development Banks in Rajasthan, which increased from a paltry Rs. 359.21 lakhs to a meteoric figure of Rs. 2117.52 lakhs during 1971-72 to 1981-82. The preferential schematic loaning norms were not adhered to by the Primary Land Development Banks. Major share of advances was absorbed by new wells' construction, diesel and electric pump sets, repair and deepening of old wells, construction of field channels and tractors. Thus minor irrigation was

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

the main purpose for which 76 per cent advances were given by the Rajasthan State Land Development Bank.

The overdues have fluctuated widely during the period under study. The ratio of overdues to outstanding loans has been increasing which is not a healthy trend for the Bank. The range of overdues over 55 per cent and above affected 8 Primary Land Development Banks in 1982 while there was none in 1976. Besides, overdues for more than five years accounted for 19.5 per cent of the total overdue.

The main causes of overdues identified are wilful default, diversion of funds, under fiinancing defaulting lending policy and procedure and lack of adequate marketing arrangements.

There has been wide variations as revealed by the inter-district and inter-regional analysis of advances. The highest rate of change in advances was realized in the semi arid zone.

There was a steep fall in per annum average growth rate of advances in the Udaipur district from 1974-75 and 1981-82 per hectare advances were highest in Udaipur and lowest in Churu, Jhunjhunu, Nagaur, Pali, Bikaner and Bundi in 1974-75. In 1981-82 the highest was in Sawai Madhopur, lowest in Barmer, Churu and Jodhpur. The tribal zone had higher per hectare advances in 1974-75 and 1981-82. Arid zone was at the lowest position at both the points of time.

As regards per agriculture household advances it was highest in Jhalawar in 1974-75 and lowest in Jaipur. In 1981-82, the highest was Jalore and Udaipur was at the bottom.

The zone-wise situation reveals that semi-arid region was at the top in 1974-75 and in 1981-82, whereas ths arid region was at the bottom at both the points of time.

The average annual increase during the period was highest in Jhunjhunu and the lowest in Jhalawar. According to zones, semi arid zone achieved the highest average annual growth rate. The normal zone stood at the bottom.

The district-wise per cent change in overdues reflects that it was declining in 10 districts while it was increasing in 15 districts. In semi-arid zone, the per cent change in overdues was reduced whereas it had increased in the tribal region.

The exercise of rank correlation reveals that higher rainfall is associated with higher credit. Larger number of holdings implies intensive loaning. It was also found that with higher proportion of SC/ST, the per hectare credit was also higher in the concerned districts. The total regular membership was highest in Bharatpur and lowest in Churu in 1974-75. Whereas

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

during 1974-75 to 1981-82 highest rate of increase in membership was achieved by Churu. In 1981-82 Bharatpur was highest and Bikaner was at the bottom.

The total regular membership as per cent of total agricultural households was highest in Sawai Madhopur and lowest in Ganganagar in 1981-82.

The distribution of agricultural holding and households is very skewed because 43.2 per cent farmers operate 6.8 per cent of the cultivated area. Banswara, Dungarpur and Sawai Madhopur had highest concentration of SC/ST population. The total percentage of loans given to small farmers is higher than their proportion in the total population.

During the period under analysis, the proportion of SC/ST in total membership has been increasing. But the proportion of credit sanctioned to the SC/ST has been declining. Moreover, the distribution of overdues defaulter in SC/ST reveals that the defaulters are more concentrated in non-SC/ST category. In all 15 Primary Land Development Banks sanctioned less proportion of loans to SC/ST than warranted by the respective proportion of SC/ST in the total population.

Advances to the weaker section, as a whole were being given in lower proportion by 15 Primary Land Development Banks. Thus, violating the norm of 50 per cent advances to these sections, and corrective measures are required to be undertaken.

The foregoing analysis clearly reveals the weaknesses and deficiencies of the organisation, management and working of the Rajasthan State Land Development Bank and Primary Land Development Banks in the State of Rajasthan. It can be said beyond any doubt that Rajasthan State Land Development Bank has performed yeoman service in the field of long-term cooperative lending and the system has come to stay. However, it would be in the fitness of the things, if we can improve upon its total performance. We are confident if the following suggestions are taken care of, it will go a long way to make Rajasthan State Land Development Bank more useful for the upliftment of the rural economy in the State :

Primary Land Development Banks should not confine their activity to long term finance only, it should extend facilities for medium term loans also. This will facilitate a proper syncronisation of the loans for various purposes and lead to optimum utilization.

Proper measures for rehabilitation of weak banks should be taken at an early date. This can be brought about by reducing

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

the cost of management and improving the recovery performance of such Banks.

The Primary Land Development Banks must take proper steps to maintain records pertaining to advances, disposal of loan applications, recovery and over-dues etc. This will go a long way to enhance the efficiency of the Primary Land Development Banks and to plug the existing loopholes.

There should be better co-ordination between the State Land Development Bank and its regional offices to avoid delay and inconvenience to the borrowers.

Some efforts must be made in the direction of standardising the cost of machinery and other equipments for which loans are given. In fact, when the payment is made direct to the dealers, the loanees are deprived of the various concessions and thereby pay enhanced rates. Therefore, it is essential that State Land Development Bank should persuade the dealers to standardise the prices and provide concessional rates as far as possible.

The State Land Development Bank should take proper steps to see that subsidy attached to the loans is sanctioned without any delay in order to reduce the burden on the poor borrowers.

The recovery proceedings are generally confined to 3 to 4 months of the year. This is not desirable. The recovery staff must remain active throughout the year.

The purposewise ceiling limit for loans must be increased according to changes in the price level which is rapidly increasing in our country. The loaning procedure must be made simplified and easier to suit the illiterate farmers.

Primary Land Development Banks should avoid reliance in interim finance because it involves higher rate of interest and in turn increases the cost of management. Instead they should rely on their internal resources. Instead recourse to internal or own sources must be maintained so as to save on interest charges.

The staffing pattern must also be streamlined so as to maximise the return.

A suitable policy for co-ordination between long term and short term financing should be developed to enable the farmers proper utilisation of capacity created in order to increase their production.

The officers on deputation exceeding a certain period should be permanently absorbed so that they have greater involvement and they can put their best efforts. Proper training must be

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

imparted to the fresh recruited staff. Besides, in service training programmes should be introduced on large scale to improve performance and impart knowledge regarding everchanging policies and procedures.

Primary Land Development Banks must start new branches in backward and problem infested areas e.g., Jaisalmer, an impotant district so far ignored.

Schematic loans which have proved very useful and can be easily monitored should be given more emphasis in future in order to reduce the quantum of ordinary loans.

It has been observed that about 76 per cent loans have been given for minor irrigation purposes. Thus, other important items which are crucial for agricultural purposes have been ignored e.g., agricultural equipment, farm-houses, cattle sheds, horticulture, fishery development, beekeeping, market yards, biogas plant, etc. These non-conventional purposes should be given greater emphasis in Primary Land Development Banks loaning in future.

Special measures must be taken for recovery of overdues aging more than 5 years. We would suggest a case by case study and proper follow-up to minimise the quantum of such overdues as far as possible. State Land Development Bank should also keep a close watch to assure that overdues of any Primary Land Development Bank do not exceed its own funds. The 15 Primary Land Development Banks identified as weak Primary Land Development Banks (June 30, 1981) on the basis of their overdues should immediately be taken under comprehensive rehabilitation programme. Meanwhile, the State Government as well as the Rajasthan State Lead Development Bank may give grants to weak Primary Land Development Banks for ranking up their bad and doubtful debts reserves.

It has been observed that per agriculture household loans and per hectare loans in arid zone districts identified as agriculturally backward, are lower as compared to other zones. This disparity must not be allowed to continue because it hinders the balanced agricultural development in the State.

The SC/ST category of farmers should be accorded a more preferential treatment than what has been done. There is urgent need for revamping the present anomaly of their increasing proportion to total membership accompanied by decreasing share in total loanings.

As many as fifteen Primary Land Development Banks have

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

violated the norm of minimum 50 per cent loans to weaker sections and State Land Development Bank should take necessary steps in this direction so that weaker sections do not suffer in these particular areas.

Out of 35 Primary Land Development Banks, 9 Primary Land Development Banks have registered losses. The State Land Development Bank should either merge these branches with other neighbouring efficient branches or take necessary steps to reverse this trend in future.

Necessary measures should be streamlined to ensure proper and maximum utilisation of resources.

Besides the above suggestions remedial measures must be taken to stop bogus loans and verification, the misuse of the official vehicles and too much political interference in the day to day working of Land Development Bank.

Land Development Bank has to play an important role for many years to come. It is therefore essential, that the existing loopholes in the present system are plugged at the earliest. The suggestions made herein will positively improve the organisational set up and working of the State Land Development Bank in our State.

पुस्तकालय

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

GURUKUL KANGRI LIBRARY
Acces on
Class on
Cat on
Tag etc.
Checked
Any Other

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar

Digitized by Arya Samaj Foundation Chennai and eGangotri

CC-0. In Public Domain. Gurukul Kangri Collection, Haridwar